A HISTORY OF THE SCIENCES

# HISTORY OF ANTHROPOLOGY

ALFRED C. HADDON

LIBRARY OF PRINCETON
JUN 5 1911
THEOLOGICAL SEMINARY.

Division GN17
Section .H12

## A HISTORY OF THE SCIENCES

**Astronomy,** by Prof. GEORGE FORBES, F.R.S.

**Chemistry, 2 volumes,** by Sir EDWARD THORPE, C.B., D.Sc., F.R.S., etc. (Director of Government Laboratories)

**Old Testament Criticism,** by Prof. ARCHIBALD DUFF (Prof. of Hebrew and Old Testament Theology in the United College, Bradford)

**New Testament Criticism,** by F. C. CONYBEARE, M.A. (Late Fellow and Prælector of Univ. Coll., Oxford)

**Anthropology,** by ALFRED C. HADDON, M.A. (Fellow of Christ's College)

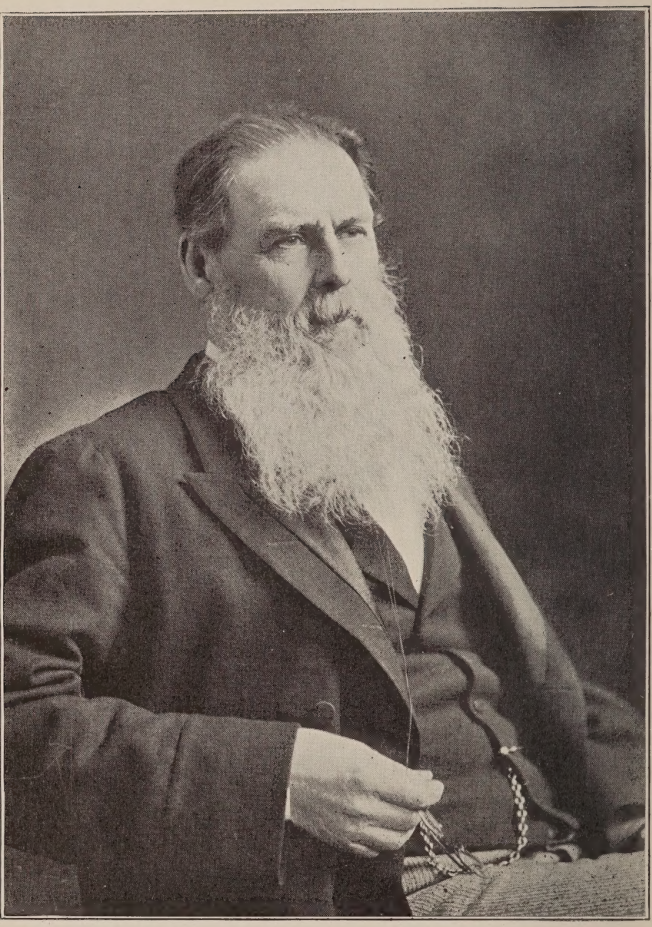
*In Active Preparation—*

**Geology,** by H. B. WOODWARD, F.R.S., F.G.S. (Assistant Director of Geological Survey)

**Geography,** by Dr. SCOTT KELTIE, F.R.G.S., F.S.A.

**G. P. PUTNAM'S SONS**

**New York** **London**



E. B. Tylor

LIBRARY OF PRINCE
JUN 5 1911
THEOLOGICAL SEMIN

# HISTORY OF ANTHROPOLOGY

BY

ALFRED C. HADDON

M.A., Sc.D., F.R.S.

FELLOW OF CHRIST'S COLLEGE, UNIVERSITY READER IN ETHNOLOGY
CAMBRIDGE

WITH THE HELP OF

A. HINGSTON QUIGGIN, M.A.

FORMERLY OF NEWNHAM, CAMBRIDGE

*WITH ILLUSTRATIONS*

G. P. PUTNAM'S SONS
NEW YORK AND LONDON
The Knickerbocker Press
1910

COPYRIGHT, 1910
BY
G. P. PUTNAM'S SONS

This series is published in London by
THE RATIONALIST PRESS ASSOCIATION, LIMITED

The Knickerbocker Press, New York

# PUBLISHERS' NOTE

A HISTORY OF THE SCIENCES has been planned to present for the information of the general public a historic record of the great divisions of science. Each volume is the work of a writer who is accepted as an authority on his own subject-matter. The books are not to be considered as primers, but present thoroughly digested information on the relations borne by each great division of science to the changes in human ideas and to the intellectual development of mankind. The monographs explain how the principal scientific discoveries have been arrived at and the names of the workers to whom such discoveries are due.

The books will comprise each about 200 pages. Each volume will contain from 12 to 16 illustrations, including portraits of the discoverers and explanatory views and diagrams. Each volume contains also a concise but comprehensive bibliography of the subject-matter. The following volumes will be issued during the course of the autumn of 1909.

**The History of Astronomy.**

By GEORGE FORBES, M.A., F.R.S., M. Inst. C.E.; author of *The Transit of Venus*, etc.

**The History of Chemistry: Vol. I. circa 2000 B.C. to 1850 A.D. Vol. II. 1850 A.D. to date.**

By Sir Edward Thorpe, C.B., LL.D., F.R.S., Director of the Government Laboratories, London; Professor-elect and Director of the Chemical Laboratories of the Imperial College of Science and Technology; author of *A Dictionary of Applied Chemistry.*

*To be followed by:*

**The History of Geography.**

By Dr. John Scott Keltie, F.R.G.S., F.S.S., F.S.A., Hon. Mem. Geographical Societies of Paris, Berlin, Rome, Brussels, Amsterdam, Geneva, etc.; author of *Report on Geographical Education, Applied Geography.*

**The History of Geology.**

By Horace B. Woodward, F.R.S., F.G.S., Assistant-Director of Geological Survey of England and Wales; author of *The Geology of England and Wales*, etc.

**The History of Anthropology.**

By A. C. Haddon, M.A., Sc.D., F.R.S., Lecturer in Ethnology, Cambridge and London; author of *Study of Man, Magic and Fetishism*, etc.

**The History of Old Testament Criticism.**

By Archibald Duff, Professor of Hebrew and Old Testament Theology in the United

College, Bradford; author of *Theology and Ethics of the Hebrews, Modern Old Testament Theology*, etc.

**The History of New Testament Criticism.**

By F. C. CONYBEARE, M.A., late Fellow and Praelector of Univ. Coll., Oxford; Fellow of the British Academy; Doctor of Theology, *honoris causa*, of Giessen; Officer d' Academie; author of *Old Armenian Texts of Revelation*, etc.

Further volumes are in plan on the following subjects:

**Mathematics and Mechanics.**

**Molecular Physics, Heat, Life, and Electricity.**

**Human Physiology, Embryology, and Heredity.**

**Acoustics, Harmonics, and the Physiology of Hearing, together with Optics Chromatics, and Physiology of Seeing.**

**Psychology, Analytic, Comparative, and Experimental.**

**Sociology and Economics.**

**Ethics.**

**Comparative Philology.**

**Criticism, Historical Research, and Legends.**

**Comparative Mythology and the Science of Religions.**

The Criticism of Ecclesiastical Institutions.

Culture, Moral and Intellectual, as Reflected in Imaginative Literature and in the Fine Arts.

Logic.

Philosophy.

Education.

# PREFACE

IT is with great diffidence that we offer this little book to the public, it being, so far as we are aware, the first attempt at a history of Anthropology. A book of small size which deals with so vast a subject, comprising, as it does, so many different studies, cannot satisfy the specialists in the several departments. In many branches the investigations are so recent that they can hardly be said to have a history, and in some cases their originators are still alive. Doubtless many will criticise the amount of space allocated to certain authors, and wonder why others have been omitted or have received but scanty recognition. All we can say in extenuation of our selection is that the task has been by no means an easy one, and we have partly been guided by the fact that our readers will mainly be of British nationality. It has been impossible to mention all of the more important of living workers, whether investigators, collectors, or systematisers; but this is not due to any lack of appreciation of their labours. In most cases references are given in

the text; a few supplemental works will be found in the Bibliography at the end of the book. The two dates which follow a name refer to the years of the individual's birth and death; a single date refers to the date of publication of the book or memoir.

We hope we have in all cases referred to the authors to whom we are indebted for information; and for personal assistance we desire to thank Dr. C. S. Myers, of Gonville and Caius College; Mr. E. E. Sikes, Tutor of St. John's College, Cambridge; and Mr. Edward Clodd.

A. C. H.

*October, 1910.*

# INTRODUCTION

IN his address to the Anthropological Section of the British Association in 1892 Professor Alexander Macalister made use of a little allegory to illustrate the growth and progress of Anthropology.

"On an irregular and unfenced patch of waste land," he said, "situated on the outskirts of a small town in which I spent part of my boyhood, there stood a notice-board bearing the inscription, 'A Free Coup,' which, when translated into the language of the Southron, conveyed the intimation, 'Rubbish may be shot here.' This place, with its ragged mounds of unconsidered trifles, the refuse of the surrounding households, was the favourite playground of the children of the neighbourhood, who found a treasury of toys in the broken tiles and oyster-shells, the crockery and cabbage-stalks, which were liberally scattered round. . . . Passing by this place ten years later, I found that its aspect had changed; terraces of small houses had sprung up, mushroom-like, on the unsavoury

foundation of heterogeneous refuse. Still more recently I notice that these in their turn have been swept away; and now a large factory, wherein some of the most ingenious productions of human skill are constructed, occupies the site of the original waste."

Here we may recognise the three stages in the progress of the science of Anthropology.

First, a heap of heterogeneous facts and fancies, the leavings of the historian, of the adventurer, of the missionary—the favourite playground of *dilettanti* of various degrees of seriousness. Next we see order arising out of chaos, and the building-up of a number of superstructures, bearing the signs of transitoriness and imperfection, finally to be replaced by the solid fabric of a coherent whole.

In this little book some of the earlier builders on the scrap-heap will be noted—the Greek philosopher, Aristotle; the Belgian anatomist, Vesalius; the Englishmen, Tyson and Prichard; the Swede, Linnæus; the Frenchman, Buffon; and the German, Blumenbach. These laid the foundations of the science, and each is claimed as the true founder of Anthropology. After these the workers become more numerous and more specialised, and they will be dealt with under the separate headings of the various branches of the subject in which they laboured,

rather than in a continuous chronological order.

"Meddling with questions of merit or priority is a thorny business at the best of times," as Huxley said; and completeness is not here aimed at. Mention can be made only of those whose work notably contributed to, or illustrates, the historical growth of the science.

It may be objected that too much attention has been given to the arm-chair workers, and too little to the labourers in the field. This is true, especially in the section on Ethnology; but it is necessitated by the compass of the volume. We attempt a brief sketch of the wood, and cannot stop to describe the individual trees that compose it. Detailed investigations, however valuable, have to be merged into generalisations; and generalisations proceed mainly from the arm-chairs.

Professor Michael Foster somewhere remarked that "hypothesis is the salt of science." The main difficulty with which observers in the field have to contend is that, as a rule, they can see only what they look for. When an investigator has left his field and is working up his results at home, he only too frequently finds that he has omitted to look for certain customs or beliefs, whose occurrence in other places he had either overlooked or forgotten. This is the justification for the questionnaires. It is one of the most important functions of stay-at-home

synthetic students laboriously to cull data from the vast literature of anthropology, travel, and ancient and modern history, and to weld them into coherent hypotheses. The student at home in this way suggests fresh inquiries to the field ethnologist, and a richer harvest is the result. The most valuable generalisations are made, however, when the observer is at the same time a generaliser; but "doubtless," as Maharbal said to Hannibal after the battle of Cannæ, "the gods have not bestowed everything on the same man. You, Hannibal, know how to conquer; but you do not know how to use your victory."

The vastness of the anthropological sciences and the nebulous character of their demarcation from other sciences render their definition or classification a peculiarly difficult matter. Even at the present day students are not agreed upon the exact terminology and limitations of the various branches of their subject; but, after all, these are little more than academic discussions, since investigations go on irrespective of boundary lines. Those who are really worried about this "terminological inexactitude" are the cataloguers and librarians, who frequently are at a loss where to place items in their catalogues or books on their shelves. It was mainly from this point of view that Dieserud was constrained to write his *Science of Anthropology: Its Scope*

*and Content.*[1] This useful little book deals very fully in historical order with the questions referred to above, and it may be recommended to those who are interested in these somewhat profitless discussions.

For the convenience of those who require landmarks we here give the scheme that is roughly followed in this book, which is based upon the classification recently proposed by the Board of Studies in Anthropology of the University of London as a guide for the study and teaching of Anthropology:—

*A.*—Physical Anthropology (Anthropography, Anthropology of some writers).

(*a*) *Zoölogical* (somatology, including craniology, etc.).—Man's place in Nature as evidenced by the study of comparative anatomy and physiology, more especially of the Anthropoidea.

(*b*) *Palæontological.*—The antiquity of man as evidenced by fossil and semi-fossilised remains, including the geological evidence.

(*c*) *Physiological and Psychological.*—The comparative study of the bodily functions and mental processes.

(*d*) *Ethnological.*—The comparative study of the physical characters which distinguish the various races and sub-races of man. Classification of the

[1] This is the title on the back of the book. Its designation on the title-page is given correctly in the Bibliography.

human race in accordance with physical and psychical characters. Geographical distribution of the varieties of mankind. The influence of environment on physique.

*B.*—Cultural Anthropology (Ethnology of some writers).

(*a*) *Archæological.*—The antiquity of man as revealed by the earliest remains of his handiwork. The prehistoric periods; their characteristics, sequence, and duration. The survival of early conditions of culture in later times (Folklore).

(*b*) *Technological.*—The comparative study of arts and industries; their origin, development, and geographical distribution.

(*c*) *Sociological.*—The comparative study of social phenomena and organisation. Birth, education, marriage, and death customs and systems. Social and religious associations. Government and laws. Moral ideas and codes. Magical and religious ideas and practices.

(*d*) *Linguistic.*—The comparative study of language.

(*e*) *Ethnological.*—The comparative study and classification of peoples based upon cultural conditions and characteristics. The influence of environment upon culture.

# CONTENTS

PAGE

PREFACE ..... vii

INTRODUCTION ..... ix

*PHYSICAL ANTHROPOLOGY*

CHAPTER I

THE PIONEERS OF PHYSICAL ANTHROPOLOGY ..... 1

Definition of the word "Anthropology." Fundamental conceptions. Race discrimination: in Bushman paintings, in the art of ancient Egypt, Assyria, etc., in Vedic literature. Hippocrates. Aristotle. Vesalius. Spigel. Tyson. Pygmies. Linnæus. Buffon. Blumenbach. Monsters and Wild Men.

CHAPTER II

THE SYSTEMATISERS OF PHYSICAL ANTHROPOLOGY.. 29

Craniology: Blumenbach, the founder of craniology. Camper and the facial angle. Various early craniologists. Retzius and the Cephalic Index. Grattan. Broca. Topinard. De Quatrefages. Virchow. Sergi. Hagen's and Macalister's criticisms of craniometry. Anthropometry: White and others. Measurements and observations of living populations: Beddoe. Virchow. Methods of dealing with anthropometrical data: Indices. Averages. Seriations. Curves. Mathematical treatment: Quetelet.

PAGE

Galton. Karl Pearson. Scientific and practical value of anthropometry: In the origin and differentiation of man. Racial history. Heredity. Galton. Miscegenation. The effect of the environment. Test of physical fitness. Identification of criminals. Bertillon. Galton.

CHAPTER III

ANTHROPOLOGICAL CONTROVERSIES..... 57

Origin of man. Polygenism and Monogenism. Lawrence. Lord Monboddo. Lamarck. Cuvier. Étienne Saint-Hilaire. Robert Chambers: *Vestiges of Creation.* Herbert Spencer. Darwin: *Origin of Species.* The negro's place in nature. James Hunt.

CHAPTER IV

THE UNFOLDING OF THE ANTIQUITY OF MAN..... 84

Fossil man. Cannstadt, Neanderthal, Spy, and other finds. *Homo Heidelbergensis, Homo primigenius, Pithecanthropus erectus.*

CHAPTER V

COMPARATIVE PSYCHOLOGY..... 95

Phrenology. Psychical research. Methods and aims of Psychology. Ethnical psychology. Bastian. Folk psychology. Experimental psychology. Eugenics.

CHAPTER VI

THE CLASSIFICATION AND DISTRIBUTION OF MAN.. 106

Race description and classification. Bernier. Linnæus. Blumenbach. Other classifications. Pruner Bey. Bory de Saint-Vincent. Isidore

PAGE

Geoffroy Saint-Hilaire. Haeckel. Broca and Topinard. Flower. Deniker. Keane. Man's place in nature. Huxley. Vogt.

*CULTURAL ANTHROPOLOGY*

CHAPTER VII

ETHNOLOGY: ITS SCOPE AND SOURCES..... 120
Definition. Sources. Herodotus. Lucretius. Strabo. Travellers. Missionaries. Systematic works on Ethnology. Prichard. Other generalisations. Ethnology and the Classics. Ethnology and Political Science.

CHAPTER VIII

THE HISTORY OF ARCHÆOLOGICAL DISCOVERY..... 135
Prehistoric man. Flint implements. Denmark. Caves: Oreston. Kirkdale. Liège. Kent's Cavern. Lake dwellings. Irish crannogs. Swiss pile dwellings. Brixham Cave. Boucher de Perthes. Subsequent progress of Archæology. France. Britain. Germany, etc. Tertiary man. Eoliths.

CHAPTER IX

TECHNOLOGY..... 155
Pitt-Rivers. Otis T. Mason. H. Balfour. H. Colley March. Stolpe.

CHAPTER X

SOCIOLOGY AND RELIGION..... 158
Comparative Ethnology. Tylor. Avebury. Sociology. Comte. Buckle. Herbert Spencer.

PAGE

Bachofen, Morgan, McLennan, and others. Magic and Religion. Anthropology and Religion. Folklore. Comparative Religion.

CHAPTER XI

LINGUISTICS ..... 179
The Aryan controversy. Language and Race.

CHAPTER XII

CULTURAL CLASSIFICATION AND THE INFLUENCE OF ENVIRONMENT ..... 186
Gallatin. Wilhelm von Humboldt. Hippocrates. Bodin. Buffon. Alexander von Humboldt, Ritter, and Waitz. Buckle. Ratzel. Reclus. Le Play.

RETROSPECT ..... 192

BIBLIOGRAPHY ..... 195

INDEX OF AUTHORS ..... 201

# ILLUSTRATIONS


PAGE

E. B. Tylor ..... *Frontispiece*

Bushmen Raiding Kafir Cattle ..... 3

Race Portraiture of the Ancient Egyptians ... 6

J. F. Blumenbach ..... 24

Upper and Side Views of Skulls of Men ..... 31

Paul Broca ..... 39

Skull of the Fossil Man of La Chapelle-aux-Saints ..... 89

P. W. A. Bastian ..... 101

J. C. Prichard ..... 128

# ANTHROPOLOGY

## CHAPTER I

### The Pioneers of Physical Anthropology

ARISTOTLE, "the father of them that know," as Dante called him, is credited with having coined the word "anthropologist"; but he did not employ it in a very complimentary sense. Describing a lofty-minded man in his *Ethics*, he terms him οὐχ ἀνθρωπολογος—not a gossip, not a talker about himself. But the word does not seem to have supplied a permanent want in the Greek world, and we meet it next in a Latin form in the sixteenth century. *Anthropologium* was then used in a restricted sense, relating to man's bodily structure; and the first work in which it occurs is generally stated to be Magnus Hundt's *Anthropologium de hominis dignitate*, which appeared in 1501, and dealt in a general way with human anatomy and physiology.

**Definition of the word "Anthropology."**

The first appearance of the word in English was probably in the seventeenth century, when an anonymous book was published bearing the title *Anthropologie Abstracted; or, The idea of Humane nature reflected in briefe Philosophicall and anatomical collections* (1655). The author defines his subject thus:

> Anthropologie, or the history of human nature, is, in the vulgar (yet just) impression, distinguished into two volumes: the first entitled *Psychologie*, the nature of the rational soule discoursed; the other anatomie, or the fabrick or structure of the body of man revealed in dissection . . . of the former we shall in a distracted rehersall, deliver our collections.[1]

The meaning of the word was scarcely clear in the beginning of the nineteenth century, when we find, in the *British Encyclopædia* of 1822, the following definitions, "A discourse upon human nature," and "Among Divines, that manner of expression by which the inspired writers attribute human parts and passions to God."

Concerning the present use of the term "Anthropology," few will take exception to the definition given by Topinard in his *l'Anthropologie* (1876): "Anthropology is the branch of natural history which treats of man and the races of man." It may be yet more succinctly

[1] See Bendyshe, p. 356.

3 BUSHMEN RAIDING KAFIR CATTLE
(*After R. Andree*)

described as "the science of man," which comprises two main divisions—the one which deals with the natural man (ἄνθρωπος, or *homo*); the other which is concerned with man in relation to his fellows, or, in other words, with social man (ἔθνος, or *socius*). At the end of the Introduction we give the classification which we propose to adopt. It should, however, be stated that, whereas in this country we employ the term "Anthropology" to cover the whole subject, it is common on the Continent to restrict the term to what we designate as "Physical Anthropology," "Anthropography," or "Somatology."

**Fundamental Conceptions.**

The beginnings of anthropology may probably be traced to what Professor Giddings (1896) has termed the "consciousness of kind," but what Dr. McDougall (1898) has more definitely recognised as showing the gregarious impulse. He says (pp. 299–300):

> The gregarious impulse of any animal receives satisfaction only through the presence of animals similar to itself, and the closer the similarity the greater is the satisfaction. . . . Just so, in any human being the instinct operates most powerfully in relation to, and receives the highest degree of satisfaction from the presence of, the human beings who most closely resemble that individual, those

who behave in like manner and respond to the same situations with similar emotions.

**Race Discrimination.**

The recognition of degrees of likeness implies the recognition of unlikeness. This may be termed the stage of race discrimination. Ancient literature and the pictorial art of certain uncivilised peoples abound in examples of race discrimination. The crude representations of human beings discovered in caves in France and elsewhere were probably intended to portray the people themselves, who lived in the palæolithic period. These drawings or carvings, like those of most modern savages, exhibit much greater skill in delineating animals than human beings; consequently it is dangerous to rely on them as representing the physical characteristics of the then existing populations. Very different is the famous Bushman pictograph of a fight between Bushmen and Kafirs. Here relative size, the difference in colour, and the employment of different implements of war by these two races, are strikingly exemplified; but as a general rule the Bushmen themselves exaggerate certain features and minimise others—for example, the head is invariably too small and featureless.

In Egypt there is an immense amount of pictorial and sculptured material for ethnological study, covering a range of many centuries. Over three thousand years ago the artists—

"untrained but not unobservant ethnologists"[1] —decorated the walls of royal tombs with representations of the four races of mankind, among whom the Egyptians of the nineteenth dynasty supposed the world to be partitioned— (1) The Egyptians, whom they painted red; (2) the Asiatics or Semites, yellow; (3) the

EGYPTIAN

SEMITE

NEGRO

LIBYAN

RACE PORTRAITURE OF THE ANCIENT EGYPTIANS
On the Tombs of the Kings at Biban-el-Molouk
(XVIIIth-XXIst Dynasty)

Southerns or Negroes, black; and (4) the Westerns or Northerners, white, with blue eyes and

[1] D. Randall-Maciver and A. Wilkin, *Libyan Notes*, 1901, p. 1.

fair beards. Each type is clearly differentiated by peculiar dress and characteristic features. In addition to these four types, other human varieties were delineated by the Ancient Egyptians, most of which can be identified. "On the Egyptian monuments we not only find very typical portraits, but also an attempt at classification; for the Egyptians were a scientific people, with a knowledge of medicine, and also skilled mathematicians; therefore their primitive anthropology is not unexpected."[1] This facility for race discrimination was still earlier exhibited in the prehistoric or early historic slate palettes of Egypt.

Belonging to the fifth century B.C. are the realistic portraiture figurines in pottery discovered by Professor Flinders Petrie at Memphis,[2] "which clearly are copied from various races which were welded together by the Persians, and who all met in the foreign settlement at Memphis." Professor Petrie identifies Sumerians or Accadians, the old Turanian people who started civilisation in Babylonia. "Their heads are identified by closely similar portraits carved in stone about 3000 B.C., and found in Mesopotamia." Persians, Scythians, Mongols,

[1] R. S. Poole, *Journ. Anth. Inst.*, xvi., 1887, p. 371. *Cf.*, also, H. G. Tomkins, *J. A. I.*, xviii., 1889, p. 206, and W. M. Flinders Petrie, *J. A. I.*, xxxi., 1901, p. 248.

[2] *Man*, viii., 1908, p. 129.

and even Indians, are also recognised by him; but some of the latter are dated by him at about 200 B.C.

Assyrian monuments are less explicit in this respect.

> The Assyrians themselves are shown to have been of a very pure type of Semites; but in the Babylonians there is a sign of Cushite blood. . . . There is one portrait of an Elamite (Cushite) king on a vase found at Susa; he is painted black, and thus belongs to the Cushite race. The Ethiopian type can be clearly seen in the reliefs depicting the Assyrian wars with the kings of Ethiopia; but it is hard to discriminate Arabs and Jews from Assyrians; in fact, it is only in the time of good art that distinctions are traceable.[1]

Rock carvings in Persia, Scythian coins, and numerous other monuments and remains from other countries and belonging to diverse ages, illustrate that the head-form, features, character of the hair and mode of wearing it, ornaments, dress, and weapons, were all recognised as means of discriminating between different peoples from the earliest times.

Ancient literature, of which one example must suffice, tells the same tale:

> The sense of differences of colour, which, for all our talk of common humanity, still

[1] Poole, *l.c.*

> plays a great and, politically, often an inconvenient part in the history of the world, finds forcible expression in the Vedic descriptions of the people whom the Aryans found in possession of the plains of India. In a well-known passage the god Indra is praised for having protected the Aryan colour, and the word meaning colour (*varna*) is used down to the present day as the equivalent of caste, more especially with reference to the castes believed to be of Aryan descent.[1]

The word "caste" is of Portuguese origin. In the 179th hymn of the first Mandala of the Rig-Veda, as Dr. Gerson da Cunha points out,[2] the word *varna* is used in the dual number, *ubhau varnau*, "two colours," white of the Aryans and black of the Dasyus—that is, of the "Dravidian" aborigines, who are elsewhere called "black-skinned," "unholy," "excommunicated." Other texts dwell on their low stature, coarse features, and their voracious appetite. The Rig-Veda employs the word *anâsa* —"noseless"—to characterise the Dasyus and Daityas, which designations mean "thieves" or "demons." It is hardly an exaggeration to say that from these sources there might be

[1] H. H. Risley, *The Tribes and Castes of Bengal: Ethnographic Glossary*, i., 1892, p. xxxviii.

[2] "Presidential Address: The Nasal Index in Biological Anthropology," *Journ. Anth. Soc. of Bombay*, 1892, p. 542.

compiled a fairly accurate anthropological definition of the jungle tribes of to-day.

Thus were the foundations of descriptive anthropology unconsciously laid.

In our own day racial characters are seized upon in the same manner, and racial antipathy adds fuel to its own fire in regarding traits which differ from those of the speaker or writer as being ugly, objectionable, or of low type. "The study of race," said the late Sir William Flower (1831–1899), "is at a low ebb indeed when we hear the same contemptuous epithet of 'nigger' applied indiscriminately by the English abroad to the blacks of the West Coast of Africa, to Kafirs of Natal, the Lascars of Bombay, the Hindoos of Calcutta, the aborigines of Australia, and even the Maories of New Zealand." [1] The Englishman who contemns as a "nigger" any dark-skinned native has not advanced in race discrimination beyond his remote kinsman who crossed into the valley of the Indus some four thousand years ago.

**Hippocrates.**

Hippocrates (460–357 B.C.), "the Father of Physic," was certainly a pioneer in physical anthropology. He says: "I will pass over the smaller differences among nations, but will now treat of such as are great either from nature or custom; and, first, concerning the macrocephali. There is no

[1] *Report Brit. Assoc.*, 1881, p. 683.

other race of men which have heads in the least resembling theirs." He believed that this elongated conformation of the head was originally produced artificially; but subsequently it was inherited, or, as he puts it: "Thus, at first usage operated, so that this constitution was the result of force; but in the course of time it was formed naturally, so that usage had nothing to do with it"—a view adopted many centuries later by Buffon and others.

Not only was Aristotle (384–322 B.C.) the first authority to make use of the word "anthropology,"[1] but he may also be described as an anthropologist. Material had been collected by travellers, such as Hanno, the Carthaginian, who encountered gorillas in Africa; by historians, such as Herodotus (who was also a traveller); and by doctors, such as Hippocrates. Aristotle was indebted to some extent to all of these; but his vast works in natural history were based mainly on what he considered of primary importance—facts of actual personal knowledge derived from personal observation. On this account alone his writings deserved the place which they held for many centuries.

**Aristotle.**

Thus, undisturbed by the dogmas of religion or philosophy, he placed man naturally among the animals (being thus, as Topinard remarks,

[1] *Cf.* p. 1.

about twenty centuries ahead of humanity), but distinguished from them by certain features —by the relative size of the brain, by two-leggedness, by mental characters, etc. Some writers regard it as improbable that either Hippocrates or Aristotle had ever dissected the human body, but it is also possible to hold an opposite view. Even Galen (c. 130 A.D.), whose anatomy held the field for more than a thousand years, had to base his conclusions on the bodies of animals, notably on those of monkeys; and, although he did not conceal the fact, it was not until the time of Vesalius that the discrepancy between simian and human anatomy was discovered.

**Vesalius.**

Vesalius (1513–1564) is the next great name in the history of physical anthropology. He was Professor of Anatomy at Padua, Bologna, and Pisa, and physician to Charles V. and Philip II. His work marks a revolution in anatomical science; for not only did he overthrow the doctrines which had been accepted for fourteen centuries, demonstrating that to a great extent Galen had studied the anatomy of the ape rather than that of man, but, by his own deductions from direct observation and original research, he established a fresh and unassailable foundation for future investigation. His services to anatomy have been compared to those of Galileo and Copernicus in the field of astronomy. His

fate was not unlike that of many other daring pioneers of the Middle Ages. He was accused of having dissected a man while yet alive, and was dragged by his enemies before the Inquisition and condemned to death. By the intercession of the king his sentence was commuted into a pilgrimage to the Holy Sepulchre; but on his return journey he was shipwrecked and drowned off the island of Zante.

Cunningham, in his Presidential Address to the Royal Anthropological Institute, 1908, refers to the work of Vesalius, whom he describes as one of the most remarkable figures in the sixteenth century. He adds:

> It is interesting to note in passing that certain racial distinctions did not escape the eye of Vesalius. "It appears," he remarks, "that most nations have something peculiar in the shape of the head. The crania of the Genoese, and, still more remarkable, those of the Greeks and Turks, are globular in form. This shape, which they esteem elegant and well adapted to their practice of enveloping the head in the folds of their turbans, is often produced by the midwives at the solicitation of the mother." He further observes "that the Germans had generally a flattened occiput and broad head, because the children are always laid on their backs in the cradles; and that the Belgians have a more oblong form, because the children are allowed to sleep on their sides."

We know that more or less continuous pressure is exerted on the pliable heads of infants to produce admired shapes, but the theory was carried rather too far when adduced, some centuries later, to account for the facial features of negroes. Lawrence, in his *Lectures on Comparative Anatomy*, attributed the flat noses and thick lips of the negro to the method of carrying babies in Africa. The negro mothers, while at work, carry their infants on their backs, and "in the violent motions required for their hard labour, as in beating or pounding millet, the face of the child is said to be constantly thumping against the back of the mother." By this rude treatment the face of the negro child was supposed to be moulded into shape; but, as Cunningham points out, no attempt was made to explain how the process of bumping produced exactly opposite results in the case of the nose and lips—reducing the prominence of the former and increasing the projection of the latter.

**Spigel.**

"The invention of the 'lineæ cephalometricæ' of Spigel, who died in the early part of the seventeenth century, may perhaps be regarded as constituting the earliest scientific attempt at cranial measurement." He drew four lines in certain directions, and a skull in which these lines were equal to each other he regarded as regularly propor-

tioned. "Although these lines are evidently not sufficient for the comparative ethnography of the present day, yet it is interesting to observe that, in ascending the zoölogical scale, these lines approximate equality just in proportion as the head measured approaches the human form."[1]

Johann Sperling, author of a *Physica anthropologia* (1668), and Samuel Haworth, who wrote *Anthropologia; or A philosophical discourse concerning man* (1680), also belong to the seventeenth century. But more important is the work of Edward Tyson, a Cambridge man, who took his degree of Doctor of Medicine in 1678. He was a Fellow, and later Censor, of the College of Physicians, Fellow of the Royal Society, and writer of numerous papers on anatomy. His fame rests mainly on the work which laid the foundations of comparative morphology, *Orang-Outang, sive Homo Sylvestris: or The Anatomy of a Pygmie compared with that of a Monkey, an Ape, and a Man* (1699). This was the first attempt to deal with the anatomy of any of the anthropoid apes, and shows very conspicuous ability on the part of the author. He compared the structure of man with that of the monkeys, and came to the conclusion that the pygmy

**Tyson.**

[1] J. Aitken Meigs, *North American Med.-Chir. Rev.*, 1861, p. 840.

formed a kind of intermediate animal between the two. The pygmy was, as a matter of fact, a chimpanzee, and its skeleton, which was thus early recognised as the "missing link," is still to be seen in the Natural History Museum (British Museum) at South Kensington. Tyson added to his work on the *Anatomy of the Pygmie, A Philological Essay, Concerning the Pygmies, the Cynocephali, the Satyrs, and Sphinges of the Ancients. Wherein it will appear that they are all either Apes or Monkeys, and not Men as formerly pretended.* The purpose of the *Essay* may be expressed in his own words:

> If therefore I can make out . . . that there were such *Animals* as *Pygmies;* and that they were not a *Race* of *Men*, but *Apes;* and can discover the *Authors*, who have forged all, or most of the idle Stories concerning them; and shew how the Cheat in after Ages has been carried on, by embalming the Bodies of *Apes*, then exposing them for the *Men* of the Country, from whence they brought them: If I can do this, I shall think my time not wholly lost, nor the trouble altogether useless, that I have had in this Enquiry.

**The Pygmies.**

This was the first attempt to explain in a rational fashion the innumerable tales found in all parts of the world about the existence of pygmy races, apemen or men-apes. Tyson's hypothe-

sis was that all these legends were based on imperfect observations of apes, and he was followed by Buffon and others. It may be well here briefly to note the researches which have led in late years to the opposite conclusion—*i.e.*, that the tales relate to a dwarf race of men formerly very widely spread over the globe.

This theory is mainly associated with the name of de Quatrefages (1810–1892). In the Introduction to his book on the pygmies he says: "For a long time past the small black races have attracted my attention and my interest in a special manner." His earliest investigations of the subject were published in 1862, and continued until 1887. Analysing the evidence, he shows that the two localities where the ancients appear to place their pygmies (the interior of Africa and the southernmost parts of Asia), together with the characters assigned to them, indicate an actual knowledge of the two groups of small people (Negrilloes and Negritoes) who are still to be found in those regions. Professor J. Kollmann, of Basel, in his *Pygmäen in Europa* (1894), argues for the existence of a European pygmy race in Neolithic times from some remains found at Schaffhausen, and the wide prevalence of short statures among many peoples in Europe, especially in the south. Mr. David MacRitchie attributes not only legends of pygmies, but fairy-tales in general, to this

prehistoric dwarf race. President Windle sums up the question thus:

> It is possible with more or less accuracy and certainty to identify most of those races which, described by the older writers, had been rejected by their successors. Time has brought their revenge to Aristotle and Pliny by showing that they were right, where Tyson and even Buffon, were wrong. (P. liii.)

In the time of Aristotle Man took his place naturally at the head of the other animals, being distinguished from the brutes by certain characters. But the influence of religion and of philosophy did not long permit this association. Man came to be regarded as the *chef d'œuvre* of creation, a thing apart, a position aptly described in the words of Saint Paul (marginal version), "for a little while inferior to the angels."

In the eighteenth century came a startling change. Man was wrenched from this detached and isolated attitude, and linked on once more to the beasts of the field. This was the work of Linnæus.

**Linnæus.**

The year 1707 is memorable in the history of anthropology as the date of the birth of two of its greatest men, Linnæus[1] (1707–1778) and Buffon (1707–1788).

[1] By a patent of nobility conferred in 1757 Linnæus became Karl von Linné.

Both devoted long lives to science, and both produced monumental works of permanent value; but it would be hard to find two contemporary figures engaged in the same pursuit whose lives presented a greater contrast.

Linnæus was the son of a poor pastor, and his mother was the daughter of the former pastor of the same small Swedish parish. At the early age of four young Karl is said to have taken an interest in botany, and to have begun to ask questions that his father could not answer. Either to escape this interrogation, or for wiser motives, the father made it a rule never to answer the same question twice, and to this early discipline Linnæus used to trace his tenacious memory. The boy was intended for the ministry, and was early sent to school; but, as he devoted all his time to botany, his progress in theology was *nil*, and when, after two years, his father visited the school, and learnt of the disappointing result of all the pinching and saving which had gone to provide for the son's education, he resolved to apprentice him to a tailor or shoemaker in hopes of obtaining a better return for his outlay. Fortunately a friend intervened, and gave the boy board and lodging, besides private tuition, while he finished his gymnasium course. His work as a student seems to have failed to satisfy his instructors, for when he proceeded to the University of Lund it was

with the enigmatic testimonial to the effect that "some shrubs in a garden may disappoint the cares of the gardener, but if transplanted into different soil may prosper."

When barely twenty-two he left Lund for Upsala, taking with him his entire fortune of £8, and, being inexperienced and unknown, soon found himself in desperate straits. He was rescued by the generosity of Dr. Celsius, a professor of theology, but student of botany, who, impressed with Karl's collections and enthusiasm, offered him board and lodging, and obtained for him some private pupils. The hardships of his life were not yet over but gradually his work obtained recognition, abroad sooner than at home, and he could have lived at his ease in England or the Netherlands; only (as he expressed it) "his Sara was in Sweden," and he returned to his native land to scrape together sufficient means to marry her.

**Buffon.**

From the beginning Georges Louis Leclerc, Comte de Buffon, was marked out for a different life. His father was a Burgundian Councillor, and his mother, besides being an heiress, was a woman of unusual ability. He was originally destined for the law, but his tastes always inclined towards science, and he soon found occasion to follow them.

He made the acquaintance of a young Englishman of rank and of his tutor, who was a man of

science, and with them he travelled on the continent. About the same time Linnæus was also travelling, but in a different fashion. He set out to make explorations in Lapland, then very little known, carrying his luggage on his back, and covered nearly 5000 miles at a cost of about £25. During his travels he kept a diary[1] of his observations, which contains not only botanical but also ethnological information of great value.

While Linnæus was living from hand to mouth, depending for his food on chance generosity, and mending his boots with folded paper, Buffon was living the gay life of the young men of his age and rank, and we hear of him being forced to flee to Paris to escape the results of wounding an Englishman in a gaming quarrel. (Linnæus was also guilty of drawing his sword in anger, but the provocation was different. During his absence from Upsala a rival had, by private influence, contrived to get a prohibition put on all private lecturing in the University, and he returned to find all his means of livelihood suddenly cut off.)

Nevertheless Buffon's life of pleasure did not occupy all his energies. He possessed, as Voltaire said, "*l'âme d'un sage dans le corps d'un athlête,*" and while in Paris he wrote and translated various scientific works, was elected a member of the Academy of Science, and in 1739

[1] See *Globus*, "Linné als Ethnologe," xci., 1907.

was appointed keeper of the *Jardin du Roi* and of the Royal Museum.

The permanent value to anthropology of the work of these two men lies in the fact that they both "saw life steadily, and saw it whole." But they produced results not only distinct, but, in some respects, antagonistic. Buffon, as Topinard says, did not classify, he described; and the value of his work has been very differently appraised. Cuvier had small opinion of it. Camper and Saint-Hilaire considered the author the greatest naturalist of modern times, the French Aristotle. Topinard (1885, p. 33) thus describes the opinion of the public: "Le public, lui, n'hésita pas; dans *l'Histoire naturelle des animaux* il sentit un souffle nouveau, vit un pressentiment de l'avenir. La libre pensée était dans l'air, 89 approchait; l'œuvre de Buffon, comme l'Encyclopédie, Voltaire, Rousseau et Bougainville, contribua à la Révolution française."

The genius of Linnæus lay in classification. Order and method were with him a passion. In his *Systema Naturæ* he fixed the place of man in nature, arranging *Homo sapiens* as a distinct species in the order *Primates*,[1] together with the apes, the lemurs, and the bats. He went

[1] The tenth edition, 1758, is the first in which the order *Primates* occurs. Earlier editions have the order *Anthropomorpha*. See Bendyshe, p. 424.

further and classified the varieties of man, distinguishing them by skin colour and other characters into four groups—a classification which holds an honourable place at the present day.

All this was abominable in the eyes of Buffon. "Une vérité humiliante pour l'homme, c'est qu'il doit se ranger lui-même dans la classe des animaux"; and in another place he exclaims: "Les genres, les ordres, les classes, n'existent que dans notre imagination. . . . Ce ne sont que des idées de convention. . . . Il n'y a que des individus!" And again: "La nature ne connait pas nos definitions; elle n'a jamais rangé ses ouvrages par tas, ni les êtres par genres."

Nevertheless both rendered incalculable service to the science. Linnæus "found biology a chaos and left it a cosmos." "L'anthropologie," says Flourens, "surgit d'une grande pensée de Buffon; jusqu-là l'homme n'avait été étudié que comme individu, Buffon est le premier qui l'ait envisagé comme espèce."

But Buffon was no believer in the permanent stability of species. "Nature is far from subjecting herself to final causes in the formation of her creatures." He went so far as to make a carefully veiled hint (the Sorbonne having eyes on him) of a possible common ancestor for horse and ass, and of ape and man. At least, he says, so one should infer from their

general resemblance; but, since the Bible affirms the contrary, "of course the thing cannot be."[1] In 1751, the naturalist was constrained by the Sorbonne to recant his geological

J. F. Blumenbach

heresies in these words: "I declare that I had no intention to contradict the text of Scripture; that I believe most firmly all therein related

[1] Quoted from Clodd's *Pioneers of Evolution*, 1897, p. 101.

about the Creation, both as to order of time and matter of fact."

It was fortunate for the nascent science that the next great name on its roll was that of a man of very wide reading, endowed with remarkable reasoning powers, and with an exceptional perspicuity for sifting out the true from the false.

**Blumenbach.**

Johann Friedrich Blumenbach (1752–1840) was Professor in the Faculty of Medicine at Göttingen, and early turned his attention to the special study of man. He was the first to place anthropology on a rational basis, and in his *De generis humani varietate nativa* (1775–1795) laid the foundations of race classification based on measurement. He noted the variations in the shape of the skull and of the face, and may therefore be regarded as the founder of craniology (see below, p. 29). Besides the services rendered by Blumenbach to the science of anthropology in classification and in laying the foundations of craniology, there was a third field in which his work was perhaps even more valuable to his contemporaries.

Every successive age is astonished at the credulity of its predecessor; but when we remember the grave difficulties which beset the explorer in the eighteenth century, and the wild "travellers' tales" which it was impossible either to verify or to disprove,

**Monsters.**

it is easy to sympathise with the credence given to the beliefs in "Anthropophagi, and men whose heads do grow beneath their shoulders." Tyson, in his *Philological Essay*, gives a list, chiefly derived from classical writers, of the "monstrous Productions," belief in which had not altogether died out in the seventeenth century. In fact, it was not long before Tyson's time that a distinguished naturalist had given a serious description of the mermen who lived in the sea and had their hinder parts covered with scales.[1] Tyson's account of "Monstrous sorts of Men" is taken mainly from Strabo:

> Such are the *Amukteres* or *Arrhines*, that want Noses, and have only two holes above their Mouth; they eat all things, but they must be raw; they are short lived; the upper part of their Mouths is very prominent. The *Enotokeitai*, whose Ears reach down to their Heels, on which they lye and sleep. The *Astomoi*, that have no Mouths—a civil sort of People, that dwell about the Head of the *Ganges;* and live upon smelling to boil'd Meats and the Odours of Fruits and Flowers; they can bear no ill scent, and therefore can't live in a Camp. The *Monommatoi* or *Monophthalmoi*, that have but one Eye, and that in the middle of their Foreheads: they have Dogs' Ears; their Hair stands on end, but smooth on the Breasts. The *Sternophthalmoi*, that have eyes in their Breasts.

[1] v. Cunningham, p. 24.

> The *Panai sphenokephaloi* with Heads like Wedges. The *Makrokephaloi*, with great Heads. The *Huperboreoi*, who live a Thousand years. The *Okupodes*, so swift that they will out-run a Horse. The *Opisthodaktuloi*, that go with their Heels forward, and their Toes backwards. The *Makroskeleis*, the *Steganopodes*, the *Monoskeleis*, who have one Leg, but will jump a great way, and are call'd *Sciapodes*, because when they lye on their Backs, with this Leg they can keep the Sun from their bodies.

Linnæus did not include these in his *Homo Monstrosus;* but various questionable creatures are inserted by his pupil Hoppius in the treatise *Anthropomorpha of Linnæus*, read in 1760.[1] Such were the *Satyr* of Vulpius, who, "when it went to bed, put its head on the pillow, and covered its shoulders with the counterpane, and lay quite quiet like a respectable woman"; *Lucifer* (*Homo caudatus*), the "dreadful foul animals—running about like cats," who rowed in boats, attacked and killed a boatload of adventurers, cooking and eating their bodies; and the *Troglodyta* (*Homo nocturnus*), who in the East Indies "are caught and made use of in houses as servants to do the lighter domestic work—as to carry water, lay the table, and take away the plates." But all these were classed among the *Simiæ*. Within the species *Homo*

[1] Bendyshe, p. 447.

*sapiens* Linnæus included wild or natural man, *Homo sapiens ferus*, whose existence was widely believed in at the time. The most authentic case was that of "Wild Peter," the naked brown boy discovered in 1724 in Hanover. He could not speak, and showed savage and brutish habits and only a feeble degree of intelligence. He was sent to London, and, under the charge of Dr. Arbuthnot, became a noted personage, and the subject of keen discussion among philosophers and naturalists. One of his admirers, more enthusiastic than the others, declared that his discovery was more important than that of Uranus, or the discovery of thirty thousand new stars.

**Wild Men.**

Blumenbach alone, apparently, took the trouble to investigate the origin of Wild Peter, and in the article he wrote on the subject disposed for all time of the belief in the existence of "natural man." He pointed out that when Peter was first met he wore fastened round his neck the torn fragments of a shirt, and that the whiteness of his thighs, as compared with the brown of his legs, showed that he had been wearing breeches and no stockings. He finally proved that Peter was the dumb child of a widower, who had been thrust out of his home by a new step-mother.[1]

[1] Cunningham, pp. 24–5.

## CHAPTER II

### The Systematisers of Physical Anthropology

HITHERTO we have been dealing with the great pioneers in anthropology, those who laid the foundations, brought order out of chaos, and suggested the outlines of future work. Henceforward anthropology may claim the name of a science, and the work developed on definite lines. It will be more convenient to treat these separately, abandoning a strict chronological method.

The first branch to attract workers was Somatology, the physical aspect of man, of which we have already noted the inception: not until the nineteenth century can Archæology, or Prehistoric Anthropology, be said to have developed into a science; while the scientific study of Ethnology, or Cultural Anthropology, is barely half a century old.

**Craniology.**

Somatology had already been foreshadowed by Vesalius, Spigel, and Linnæus; but Blumenbach was the first to strike its keynote by recording the shape of

the skull and of the face. He was the fortunate possessor of a large number of skulls—large, that is, for his time—and he published a description of them (1790–1820), *Decas collectionis suæ craniorum diversarum gentium illustrata*, with 70 plates. He noted particularly the *norma verticalis—i.e.*, the shape of the skull as seen from above, distinguishing by its means three types—the square shape of the Mongols, the narrow or "pressed in from the sides" shape of the Negroes, and the intermediate form which he recognised in the "Caucasians." He was the first to popularise craniology, and "it became the fashion to visit the Blumenbachian Museum, to have the differences which distinguish the different cranial types pointed out, and to indulge in sentimental rhapsodies upon the beauty and symmetry of the young female Georgian skull, which was considered to represent the highest type of all."[1] But Blumenbach does not seem to have taken advantage of his own discoveries. In choosing the *norma verticalis* as a racial criterion he made a valuable contribution to science, but he did not reproduce his *normæ* in his plates, nor did he base his classification on them. Indeed, his typical Caucasian skull is really squarer than his typical Mongolian.

**Norma Verticalis of Blumenbach.**

[1] Cunningham, p. 26.

Peter Camper (1722–1789) had already been studying head-form, though from a totally different standpoint, and his deductions were not published until after his death.

**Facial Angle of Camper.**

Upper and Side Views of Skulls of Men belonging to the Neolithic and Bronze Age Races; photographed by the Author from specimens in the Cambridge Anatomical Museum

*A*. Long Barrow, Dinnington, Rotherham. Length, 204 mm.; breadth, 143 mm.; cranial index, 70.1

*B*, Winterbourne Stoke. Length, 177 mm.; breadth, 156 mm.; cranial index, 88.1

His contributions to Anthropology were an essay on the *Physical Education of the Child*, a lecture on *The Origin and Colour of the Negro*, and a treatise on *The Orang-outang and some other species of Apes;* but only his work on the facial angle has attained permanent fame. His early inclinations were towards art, and he was carefully trained in drawing, painting, and architecture; and it was in the interests of art, not of anthropology, that the researches which resulted in his determination of the facial angle came to be undertaken. This he describes in his preface to his lectures:

> At the age of eighteen, my instructor, Charles Moor the younger, to whose attention and care I am indebted for any subsequent progress I may have made in this art, set me to paint one of the beautiful pieces of Van Tempel, in which there was the figure of a Negro, that by no means pleased me. In his colour he was a Negro, but his features were those of a European. As I could neither please myself nor gain any proper directions, I desisted from the undertaking. By critically examining the prints taken from Guido Reni, C. Marat, Seb. Ricci, and P. P. Rubens, I observed that they, in painting the countenances of the Eastern Magi, had, like Van Tempel, painted black men, but they were not Negroes.

To obtain the necessary facial effects dis-

tinguishing the Negro from the European, Camper devised his system of measurements. He drew a line from the aperture of the ear to the base of the nose, and another from the line of the junction of the lips (or, in the case of a skull, from the front of the incisor teeth) to the most prominent part of the forehead. "If," he said, "the projecting part of the forehead be made to exceed the 100th degree, the head becomes misshapen and assumes the appearance of hydrocephalus or watery head. It is very surprising that the artists of Ancient Greece should have chosen precisely the maximum, while the best Roman artists have limited themselves to the 95th degree, which is not so pleasing. The angle which the facial or characteristic line of the face makes," he continued, "varies from 70 to 80 degrees in the human species. All above is resolved by the rules of art; all below bears resemblance to that of apes. If I make the facial line lean forward, I have an antique head; if backward, the head of a Negro. If I still more incline it, I have the head of an ape; and if more still, that of a dog, and then that of an idiot."

Camper's facial angle may be of service to art, but since the points from which the lines are drawn are all variable owing to the disturbing influence of other factors, such as an increased length of face or an unusually prominent brow-ridge, it cannot form an accurate measurement

for anthropology. It was severely criticised by Blumenbach, Lawrence, and Prichard, but adopted in France, and by Morton in America.

Dr. J. Aitken Meigs[1] pointed out that as early as 1553 the measurement of the head appears to have exercised the ingenuity of Albert Dürer, who, in his *De Symmetriâ Partium in Rectis Formis Humanorum Corporum*, has given such measurements in almost every view. These, however, are more artistic in their tendency and scope than scientific. A glance at some of the outline drawings of Dürer shows incontestably that the facial line and angle were not wholly unknown to him, and that Camper has rather elaborated than invented this method of cranial measurement. The artist even seems to have entertained more philosophical views of cephalometry, or head measurement, than the professor.

**Various Early Craniologists.**

The evolution of craniometrical measurements is of interest to the physical anthropologist, but even a brief recital of this progress would weary the non-specialist. A history of anthropology would, however, not be complete if it ignored the general trend of such investigations.

Some of the early workers, such as Daubenton (1716–99) and Mulder, Walther, Barclay, and

[1] *North American Med.-Chir. Rev.*, 1861, p. 840.

Serres in the first half of the nineteenth century, attempted to express the relation between the brain-case and the face by some simple measurement or method of comparison in their endeavour to formulate not only the differences between the races of mankind, but also those which obtain between men and the lower animals.

Others during the same period investigated the relations and proportions of portions of the skull to the whole by means of lines. Spix (1815) adopted five lines. Herder employed a series of lines radiating from the atlas (the uppermost bone of the vertebral column); but, more generally, the *meatus auditorius* (ear-hole) was the starting-point (Doornik, 1815).

The internal capacity of the skull first received attention from Tiedemann (1836), who determined it by filling the skull with millet seed and then ascertaining the weight of the seed. Morton first used white pepper seed, which he discarded later for No. 8 shot, while Volkoff employed water. Modifications in the use of these three media—seeds, shot, and water—are still employed by craniologists.

The most noteworthy names among the earlier workers in craniology are those of Retzius and Grattan. Anders Retzius (1796–1860) correlated the schemes of Blumenbach and Camper, and so arrived at the methods of craniological

measurements which are almost universally in use at the present day.

In 1840 he introduced his theory regarding cranial shapes to the Academy of Science at Stockholm, and two years later gave a course of lectures on the same subject. He criticised the results attained by Blumenbach, showing that his group contains varying types of skull form; and he invented the cephalic index, or length-breadth index—*i.e.*, the ratio of the breadth of a skull to its length, expressed as a percentage. The narrower skulls he termed dolichocephalic, the broader ones brachycephalic. By this method Retzius designed rather to arrange the forms of crania than to classify thereby the races of mankind, though he tried to group the European peoples more or less according to their head-form. While thus elaborating the suggestion of Blumenbach, he also recorded the degree of the projection of the jaws, demonstrated by Camper, and he added the measurements of the face, height, and jugular breadth. Thus was Craniology established on its present lines.

**Cephalic Index of Retzius.**

John Grattan (1800–1871), the Belfast apothecary, has never received the recognition that was his due. Having undertaken to describe the numerous ancient Irish skulls collected by his friend Edmund Getty, he soon became impressed by the absence of

**Grattan.**

> that uniformity of method and that numerical precision without which no scientific investigation requiring the co-operation of numerous observers can be successfully prosecuted. The mode of procedure hitherto adopted furnishes to the mind nothing but vague generalities . . . until we can record with something approaching towards accuracy the proportional development of the great subdivisions of the brain, as indicated by its bony covering, and by our figures convey to the mind determinate ideas of the relation they bear towards each other, we shall not be in a position to do justice to our materials. . . . No single cranium can *per se* be taken to represent the true average characteristics of the variety from which it may be derived. It is only from a large deduction that the ethnologist can venture to pronounce with confidence upon the normal type of any race.[1]

Grattan devised a series of radial measurements from the *meatus auditorius*, and constructed an ingenious craniometer. As Professor J. Symington points out, "Grattan's work was almost cotemporaneous with that of Anders Retzius, and nearly all of it was done before the German and French Schools had elaborated their schemes of skull measurements."[2] He adopted the most useful of the measurements then

[1] J. Grattan, *Ulster Journal of Arch.*, 1858.

[2] *Proc. Belfast Nat. Hist. and Phil. Soc.*, 1903–4; and *Journ. Anat. and Phys.*

existing, and added new ones of his own devising.

The distinguished American physician and physiologist Dr. J. Aitken Meigs laid down the principles that "Cranial measurements to be of practical use should be both absolute and relative. Absolute measurements are necessary to demonstrate those anatomical differences between the crania of different races which assume a great zoölogical significance in proportion to their constancy. By relative measurements of the head we obtain an approximate idea of the peculiar physiological character of the inclosed brain . . . the craniographer, in fact, becomes the cranioscopist" (1861, p. 857). In this paper Meigs gives craniometrical directions, some of which were designed to give measurements for portions of the brain.

In France the greatest names are those of Broca, Topinard, and de Quatrefages. Pierre Paul Broca (1824–1880) was first destined for the army, but when the death of his sister left him the only child he was unwilling to leave his parents, and resolved to study medicine and share the work of his father, an eminent physician. He soon distinguished himself, especially in surgery, not only in practical work, but also in his writings. With regard to the latter, Dr. Pozzi, in a memoir, says of him: "There is hardly one of the sub-

**Broca.**

jects in which he did not at the first stroke make a discovery, great or small; there is not one on

Paul Broca

which he has not left the mark of his originality."[1]

[1] *J. A. I.*, x., 1881, p. 243.

In 1847 he was appointed to serve on a Commission to report on some excavations in the cemetery of the Celestins, and this led him to study craniology, and thence to ethnology, in which his interest, once aroused, never flagged. The story of the formation of the *Société d'anthropologie de Paris* (1859) and of *l'École d'anthropologie* (1876), of both of which Broca was the moving spirit, affords a curious commentary on the suspicion in which anthropology was held. To the success of the School he devoted all his energies, and during many years of anxiety he met and overcame all obstacles, surmounted all difficulties, bore down all opposition, and finally placed it in a secure position. He invented several instruments for the more accurate study of craniology, such as the occipital crochet, goniometer, and stereograph, and also standardised methods; but, dissatisfied with the inconclusiveness of mere cranial comparisons, he turned towards the end of his life to the study of the brain. He was an indefatigable worker, and his sudden death in his fifty-sixth year is attributed to cerebral exhaustion.

"Broca was a man," said Dr. Beddoe, "who positively radiated science and the love of science; no one could associate with him without catching a portion of the sacred flame.

Topinard has been the Elisha of this Elijah."[1]

Topinard.

Paul Topinard, pupil, colleague, and friend of Broca, made valuable investigations on the living population of France, besides devoting much time to anthropometrical studies; but his greatest service has been the preparation and publication of *l'Anthropologie* (1876), a guide for students and a manual of reference for travellers and others, voicing the idea of Broca and his school, and "elucidating in a single volume a series of vast dimensions, in process of rapid development." In 1885 he published his classic *Eléments d'anthropologie générale*,[2] which aimed at creating a new atmosphere for the science, breaking free from the traditions of the monogenists and polygenists, and incorporating the new ideas spread by Darwin and Haeckel.

De Quatrefages.

Armand de Quatrefages de Bréau (1810–92) was not only a distinguished zoölogist, occupying himself mainly with certain groups of marine animals, but also Professor of Anthropology at the Paris Museum of Natural History, and

[1] Anniversary Address, Anth. Inst., 1891.

[2] General anthropology, according to Topinard's classification, is concerned merely with man as an animal, and deals with anatomy and physiology, pathology, and psychology.

undertook several voyages along the coasts of the Mediterranean and the Atlantic in search of information. In 1867 he published *Rapport sur le progrès de l'Anthropologie*, "which reduces to a complete and intelligible system the abstruse and difficult, and, to many, the incomprehensible science of anthropology, embracing during his investigations a wide range of topics, and arranging disjointed facts in due order, so as at once to evince their bearing upon the subject."[1] He published many other works, among them *Les Pygmées* (1887), *L'espèce humaine* (1877), *Histoire générale des races humaines* (1889), and, together with E. T. Hamy, the famous *Crania ethnica* (1875–79). Professor F. Starr, in the preface to his translation of *The Pygmies* (1895), says:—

> A man of strong convictions and very conservative, de Quatrefages was ever ready to hear the other side, and ever candid and kindly in argument. He was one of the first to support the Society of Anthropology. Those who know the story of the early days of that great association understand what that means. When the claim for man's antiquity was generally derided, de Quatrefages championed the cause. A monogenist [p. 57], a believer in the extreme antiquity of our race, he was never won over by any of the proposed theories of evolution. . . .

[1] *Anth. Rev.*, 1869, p. 231.

> To the very end of a long life our author lived happily and busily active among his books and specimens.

In Germany the greatest name is that of Virchow. Rudolf Ludwig Karl Virchow (1821–1902) had already gained fame in the medical world, especially with regard to histology, pathology, and the study of epidemics, and was the prime leader in the "*Medizinische Reform*" movement before he began his valuable contributions to the science of anthropology.

**Virchow.**

His first anthropological writings were some papers on cretinism (1851 and 1852), and from this date onwards his services to the science can scarcely be overestimated. Much of his energy was also given to somatic anthropology, and in 1866 he started his investigations into prehistoric archæology, combining scientific method with spade-work.

In a notice of his work by Oscar Israel[1] (p. 656) we read:—

> Virchow devoted himself to ethnographic studies no less than to other branches of anthropology, and here he became a centre to which the material streamed from all sides, and from which went forth suggestion, criticism, and energetic assistance. This

[1] Smithsonian Report, 1902. Translated from the *Deutsche Rundshau* of Dec., 1902.

never-idle man did not disdain to teach travellers schooled in other lines of investigation the anthropometric methods; and, indeed, he found time for everything, and never left a piece of work to others that he could possibly do himself. Thus, for example, for ten years following its inception by him in 1876, he worked up alone the data recorded in German schools as to the colour of the eyes, the hair, and the skin which has proved of such value for the knowledge of the different branches of the German race.

Professor Sergi at one time proposed to banish measurements from craniology, and to rely solely on observational methods. He has later modified his extreme position, while, as a result of his crusade, he has induced most anthropologists to pay more attention to the configuration of the skull, and some of his descriptive terms have come into common use.

**Sergi.**

Dr. Hagen relates the extreme specialisation into which craniologists were led:—

A rage for skull measurements, vast, vigorous, and heedless, set in on all sides, especially after Lucae had discovered and perfected a method of accurately representing the irregular form of the object studied. "More skulls" was henceforth the war-cry; the trunk, extremities, soft tissues, skin, and hair,

**Hagen's Criticism of Craniometry.**

might all go by the board, being counted of no scientific value whatever. Anthropologists, or those who aspired to the title, measured and delineated skulls; museums became veritable cities of skulls, and the reputation of a scientific traveller almost stood or fell with the number of crania which he brought back with him.

After two decades of measuring and collecting ever greater quantities of material from foreign lands, and from the so-called primitive or aboriginal races, the inadequacy of Retzius's method became apparent. Far too many intermediate forms were met with, which it was found absolutely impossible to classify by its means. In accordance with the suggestion of the French anthropologist Broca, and of Welcker, Professor of Anatomy at Halle, a third type, the so-called mesocephalic form, was interposed between the two forms recognised by Retzius. Even this did not suffice, however. In the face of the infinite variety of form of the crania now massed together, a variety only comparable to that of leaves in a forest, this primitively simple scheme, with its four and finally six types, failed through lack of elasticity. Then began complication extending ever further and further. Attention was no longer confined to the length and breadth, but also to the height of the cranium, high and low (or flat) skulls—*i. e.*, hypsicephalic and chamæcephalic varieties being recognised. The facial part of the skull was examined not only from the side, with a view to recording the straightness or obliquity of the

profile, but also from the front; and there were thus distinguished long, medium, and short faces, and also broad and narrow facial types. The nasal skeleton, the palate, the orbit, the teeth, and the mandible were investigated in turn, and at last all the individual bones of the cranium and face, their irregularities of outline, and their relations to one another, were subjected to the closest examination and most subtle measurements, with instruments of extreme delicacy of construction and ingenuity of design, till, finally, the trifling number of five thousand measurements for every skull found an advocate in the person of the Hungarian Professor V. Török (whereby the wealth of detail obscured the main objects of study); while, on the other hand, observers deviated into scientific jugglery, like that of the Italian Professor Sergi, who contrived to recognise within the limits of a single small archipelago, the D'Entrecasteaux group of islets near New Guinea, as many as eleven cranial varieties, which were all distinguished by high-sounding descriptive names, such as *Lophocephalus brachyclitometopus*, etc.

The misuse of craniometry is also described by Professor Alexander Macalister:[1]—

Despite all the labour that has been bestowed on the subject, craniometric literature is at present as unsatisfactory as it is dull. Hitherto observations have been concentrated

[1] Presidential Address to Section H., Brit. Ass., 1892.

on cranial measurements as methods for the discrimination of the skulls of different races. Scores of lines, arcs, chords, and indexes have been devised for this purpose, and the diagnosis of skulls has been attempted by a process as mechanical as that whereby we identify certain issues of postage-stamps by counting the nicks in the margin. But there is underlying all these no unifying hypothesis; so that when we, in our sesquipedalian jargon, describe an Australian skull as microcephalic, phænozygous, tapeino-dolichocephalic prognathic, platyrhine, hypselopalatine, leptostaphyline, dolichuranic, chamæprosopic, and microseme, we are no nearer to the formulation of any philosophic concept of the general principles which have led to the assumption of these characters by the cranium in question, and we are forced to echo the apostrophe of Von Török, "Vanity, thy name is Craniology."

**Macalister's Criticism of Craniometry.**

It is significant that so many of the earlier craniologists recognised that the really important problem before them was to gain a knowledge of the size and relative proportions of the various regions of the brain, this being a direct result of the phrenological studies then so much in vogue. When phrenology became discredited, this aspect of craniometry was largely neglected; but recently it has exhibited signs of a healthy revival, and the inner surface of the cranium

is now regarded as more instructive than the outer.

Though for a time craniology was hailed as the magic formula by which alone all ethnological tangles could be unravelled, measurements of other parts of the body were not ignored by those who recognised that no one measurement was sufficient to determine racial affinities.

Thus anthropometry began to map out definite lines of research, and detailed studies were made of arms and legs, hands and feet, curves and angles, brains and viscera; while, shorn of its extravagant claims, craniology took its legitimate place as one in a series of bodily measurements. One of the earliest workers in measurements other than that of the skull was Charles White (1728–1813).

**Anthropometry.**

His contribution to somatology was a series of measurements on arms; and he discovered that the forearm of the Negro is longer, in comparison with his upper-arm, than that of the European, and that that of the ape is relatively longer than that of the Negro. On account of these measurements on the living (no less than fifty Negroes were measured), White has been claimed as the founder of anthropometry. Soemmerring (1755–1830), however, had made use of measurements in his comparison of the anatomy of the Negro with the European.

About the middle of the nineteenth century observations on the living were made, in addition to anthropometry; investigations were undertaken, not of the skulls and bones of the dead, or even of the head-forms and body-measurements of the living, but of the forms of such features as the nose and ear, pigmentation of the skin and eyes, and the like. As early as 1834 L. R. Villermé had started investigations on the various classes of the population of Great Britain, comparing the dwellers in the country with those of manufacturing districts and large cities, mainly in the interests of hygiene; and later he examined the size and health of children working in coal-mines.

**Measurements and Observations of Living Populations.**

In 1861 the venerated Dr. John Beddoe published a study of hair and eye colour in Ireland, and he has continued his researches in this fruitful field from time to time in various parts of the British Isles, and to a less extent on the continent of Europe.

But it was on the continent that this method of investigation was most ardently prosecuted; and the story of its political origin may here be briefly recounted, since the results were of great service to the science of anthropometry.

During the bombardment of Paris, in the Franco-Prussian War, the Natural History

Museum suffered some damage through shells; and soon afterwards the director, de Quatrefages, published a pamphlet on *La Race Prussienne* (1871). This was to show that the Prussians were not Teutonic at all, but were descended from the Finns, who were classed with the Lapps as alien Mongolian intruders into Europe. They were thus mere barbarians, with a hatred of a culture they could not appreciate; and their object in shelling the museum was "to take from this Paris that they execrate, from this Babylon that they curse, one of its elements of superiority and attraction. Hence our collections were doomed to perish." A reply was made by Professor Virchow, of Berlin, and the battle raged furiously. The significance of this controversy to anthropometry lies in the fact that its immediate result was an order from the German Government authorising an official census of the colour of the hair and eyes of 6,000,000 school children of the Empire—a census which served at once as a stimulus to and a model for further investigators.

This census had some amusing and unexpected results, quoted by Dr. Tylor[1] as illustrating the growth of legends:—

> No doubt many legends of the ancient world, though not really history, are myths which have arisen by reasoning on actual

[1] Pres. Add. Brit. Ass., 1879.

events, as definite as that which, some four years ago, was terrifying the peasant mind in North Germany, and especially in Posen. The report had spread far and wide that all Catholic children with black hair and blue eyes were to be sent out of the country, some said to Russia; while others declared that it was the King of Prussia who had been playing cards with the Sultan of Turkey, and had staked and lost 40,000 fair-haired, blue-eyed children; and there were Moors travelling about in covered carts to collect them; and the schoolmasters were helping, for they were to have five dollars for every child they handed over. For a time popular excitement was quite serious; the parents kept their children away from school and hid them, and when they appeared in the streets of the market town the little ones clung to them with terrified looks. . . . One schoolmaster, who evidently knew his people, assured the terrified parents that it was only the children with blue hair and green eyes that were wanted—an explanation that sent them home quite comforted.

Observations of external characters, combined with precise measurements, have now been made on a large scale in most European countries, and these methods are adopted on anthropological expeditions. In this way a great deal of valuable material for study has been accumulated, but much work remains to be done in this direction.

Not only have head, body, and limb measure-

ments been recorded, but the device of an "index" has been adopted which gives the ratio between two measurements, as, for example, in the previously-mentioned cephalic index (p. 36). The averages or means of series of indices obtained from one people have been compared with those obtained from other peoples; but this method is misleading, as there is frequently a very considerable range in any given series, and a mean merely gives a colourless conception of racial types, the only value of which is a ready standard of comparison, which, however, is full of pitfalls.

**Methods of Dealing with Anthropometric Data.**

A further step in the advancement of anthropometric research was made when the extent and frequency of such deviations from the mean were recorded. At first this was done in a tabular manner by means of seriations; then curves were employed: a single peak was held to indicate purity of race, double peaks that two racial elements entered into the series measured; a broad peak or plateau was interpreted as being due to race fusion. Dr. C. S. Myers,[1] who has discussed these and other methods, points out the fallacies of this interpretation, saying: "There can be little doubt that most of the

[1] C. S. Myers, "The Future of Anthropometry," *Journ. Anth. Inst.*, xxxiii., 1903, p. 36.

many-peaked curves owe their irregularity to the inadequate number of individual measurements which have been taken."

Dr. Myers emphatically states:—

> If physical anthropology is to be a science, its results *must* be capable of expression in mathematical formulæ. To this end some of the most interesting of biological work of the age is tending . . . generally speaking, the study of living forms is passing from the descriptive to the quantitative aspect, and it is by experiment and observation on biometrical lines that future progress is clearly promised. . . . Thanks to the recent work of Professor Karl Pearson, the proper start has at last been made.

His school is now attacking by statistical methods the problem of the dependence of the variation of one character upon that of another. It should be remembered that Quetelet was the first to apply the Gaussian Law of Error to human measurements in its elementary binomial form; in this he was followed by Sir Francis Galton, who was the first in this country to realise the importance of applying mathematical methods to anthropological measurements and observations. An interesting account of the genesis of his work in this direction is given in his *Memories of My Life* (1908). Similar work has also been undertaken by German investigators.

We may conclude this chapter with a brief summary of the main lines which investigations are now taking; but it is impossible to mention even the more important of recent workers in this vast field.

**Scientific and Practical Value of Anthropometry.**

From the beginning of the study, anthropometry was employed as a precise means of expressing the differences between man and the lower animals; and, owing to improved methods of research and the discovery of new material, the origin and differentiation of man is still investigated with assiduity.

Though no one measurement can be used for purposes of race discrimination, yet a series of measurements on a sufficiently large group of subjects, together with observations on the colour of the skin, hair, and eyes, the form of various organs—such as the nose and ears,—and other comparisons of a similar nature, are invaluable in the study of the races of mankind. It is only in this way that the mixtures of the population can be sorted out, their origins traced, and some idea gained of the racial migrations which have taken place since man first appeared.

Through the initiative of Sir Francis Galton, as Dr. Myers points out, anthropometry has begun to investigate other problems which

must ultimately be of ethnological interest; and he has opened out the whole subject of heredity, which eventually must enter into every branch of physical anthropology. The followers of Mendel are at present laying a foundation upon their experiments with plants and animals. At present very little attention has been paid by them to man; nor, probably, can much be attempted until more precise data are available.

Lamentably little is known with accuracy about the physical and psychical effects of the mixture of different human types, and it is yet to be determined how far the admitted unsatisfactory character of many half-caste populations is due to physiological or sociological causes.

There is a great dearth of sufficiently numerous and reliable observations and statistics concerning the effect of the environment upon small or large groups of human beings—a problem to which Professor Ridgeway devoted his last presidential address to the Royal Anthropological Institute (1910).

It is often important that the physical fitness of people should be tested, in order to see how they stand in relation to other people, and to discover any physical imperfections. Especially is this desirable in the case of children; and the government inspection of school children, though inadequate, is a step in the right direction. By such means early inclinations to various

defects are discovered and prevented, and valuable statistics are obtained which can not only be utilised for comparative purposes, but may form a basis for future legislation. It is also a matter of importance to determine whether certain imperfections are due to diseased, abnormal, or other undesirable factors in their parentage; or whether they are the results of unfavourable subsequent conditions. But in order that comparisons can be made, it is necessary to make similar investigations on the normal, capable, and healthy population.

Another branch of investigation was undertaken mainly for the identification of criminals, and consisted in certain measurements selected by M. Alphonse Bertillon, supplemented by photographs and a record of individual peculiarities. The practical value of this method of identification in France was demonstrated by its immediate results. Criminals began to leave off aliases, and numbers of them flocked to England. Finger-prints as a means of identification were first discovered by Purkenje, the Breslau physiologist (1823), who utilised them for classification. Sir William Herschel, of the Indian Civil Service, adopted the method in Bengal, and now methods introduced by Sir Francis Galton are in use in India, England, and elsewhere, having in most cases supplanted the Bertillon system.

## CHAPTER III

### Anthropological Controversies

NEXT to geographical discovery, perhaps the most stimulating influence on anthropology has been the succession of controversies in which it has constantly been involved. It has always been regarded as a somewhat anarchical subject, advocating views which might prove dangerous to Church and State; and many are the battles which have raged within and without. Huxley attributed the large audiences which were wont to throng the Anthropological Section of the British Association to the innate bellicose instincts of man, and to the splendid opportunities afforded by anthropology for indulging those propensities.[1]

The discussions of the earlier centuries were focussed round the question of the origin of man, and from this highly debatable problem arose the two antagonistic groups of the monogenists, or orthodox school, deriving all mankind from a

[1] Add. Brit. Ass., Dublin, 1878.

single pair, and the polygenists, who believed in a multiple origin. Before the discoveries of prehistoric archæology had advanced sufficiently to show the futility of such discussion, anthropologists were split up into opposing camps by the question of the fixity of species, and became embroiled in one of the fiercest controversies of modern times—that of evolution. A subordinate subject of contention, implicated in the polygenist doctrines, was the place of the Negro in nature, involving the question of slavery.

**Origin of Man.**

Among the ancient philosophers the question of the origin of man was answered in various ways; some, like Pythagoras, Plato, and Aristotle, believed that mankind had always existed, because there never could have been a beginning of things, relying on the scholastic argument that no bird could be born without an egg, and no egg without a bird. Epicurus and Lucretius believed in a "fortuitous cause," a preparation of fat and slimy earth, with a long incubation of water and conjunction of heavenly and planetary bodies. Others, that men and animals "crawled out of the earth by chance," "like mushrooms or blite."

With the spread of Christianity the Mosaic cosmogony became generally adopted, and monogenism developed into an article of faith.

The Church fulminated against those atheists who admitted doubts on the subject of Adam and Eve, or believed in the existence of antipodal man, or that man had existed for more than the 6000 years allotted to him by Scripture. If the censure of the Church did not lead to recantation, the heretic was burnt. A seventeenth-century divine, Dr. Lightfoot, Vice-Chancellor of the University of Cambridge, was even more precise than Archbishop Ussher: he reached the conclusion that "man was created by the Trinity on October 23, 4004 B.C., at nine o'clock in the morning."[1]

The discovery of the New World dealt a severe blow to the authority of the Fathers on matters of science. Antipodal man, whom St. Augustine[2] had extinguished as "excessively absurd," was found to exist, and the Spaniards forthwith excused their barbarities to the American natives on the plea that they were not the descendants of Adam and Eve.

Henceforward the polygenists began to gain ground. Theophrastus Paracelsus (1520) first asserted the plurality of the races of mankind, and explained the Mosaic cosmogony as having been written "theologically — for the

**Polygenism and Monogenism.**

[1] Clodd, *Pioneers of Evolution*, quoting from White, *Warfare of Science with Theology*.

[2] *De Civitate Dei*.

weaker brethren." Vanini (1616) mentions a belief, entertained by atheists, that man was descended from or allied to monkeys. In 1655 Isaac de la Peyrère, a Calvinist scholar of Bordeaux, published in Amsterdam his *Præ-Adamitæ*, to prove that Adam and Eve were not the first human beings upon the earth; and his work, being prohibited by authority, became immensely popular.

His theory, though unorthodox, was founded on Scripture, and regarded Adam and Eve as merely a special and much later creation; the Gentiles, who peopled the rest of the earth, having been formed from the dust of the earth, together with the beasts of the field, on the sixth day. The inhabitants of the New World, which, being separate from the Old, could not have been peopled with the same race, were of Gentile origin. This theory was bitterly opposed. The *Parlement* of Paris caused the book to be publicly burned. The Inquisition laid hands on the author, and he was forced to abjure both his Pre-Adamite heresy and his Calvinism. He died in a convent in 1676.

The writings of the Encyclopedists, the freedom of thought claimed by Voltaire and Rousseau, together with the classification of species by Linnæus, emboldened the polygenists. Lord Kames[1] was one of the earliest exponents in

[1] *Sketches on the History of Man*, 1774.

England, and he soon found many followers. Two separate lines of antagonism may be distinguished in the controversy. In one—the Anglo-French—Prichard, Cuvier, and de Quatrefages represent the monogenists, and Virey and Bory de Saint-Vincent the polygenists; the other, in which America and the slavery question were implicated, polygenists and anti-abolitionists going hand-in-hand, was represented by Nott and Gliddon in America, Knox and Hunt in England, and Broca in France.

When materials began to accumulate they were detrimental to the polygenist theory. Especially was this the case with regard to the proof of what Broca termed "*eugenesis*"—*i.e.*, that all the *Hominidæ* are, and always have been, fertile with each other. This, which formed a test between species and varieties in botany and zoölogy, was claimed also in anthropology, and the polygenists had to seek for support elsewhere. They found it in linguistics; "language as a test of race" bulked large in ethnological controversy, and is not yet entirely extinct.

At first the monogenists claimed language as supporting their views. All languages were to be traced to three sources—Indo-European, Semitic, and Malay; and these, in their turn, were the offspring of a parent tongue, now entirely lost. But it was soon found impossible

to reconcile even Aryan and Semitic, and a common parent for all three languages was inconceivable. The linguistic argument then passed over to the polygenists.

Hovelacque stated that "the ascertained impossibility of reducing a multiplicity of linguistic families to a common centre is for us sufficient proof of the original plurality of the races that have been developed with them." M. Chavée[1] went further. "We might," he says, "put Semitic children and Indo-European children apart, who had been taught by deaf-mutes, and we should find that the former would naturally speak a Semitic language, the latter an Aryan language." F. Müller and others took up this line of argument, holding that distinct stock languages proved the existence of distinct stock races. But, as Professor Keane points out, in his summary of the controversy (1896, chap. vii.), *quod nimis probat, nihil probat*—"what proves too much, proves nothing" —and the hundred or more stock languages in America alone, reduced the argument to an absurdity.

**Monogenists.**

Among the monogenists may be included most of the older anthropologists—Linnæus, Buffon, Blumenbach, Camper, Prichard, and Lawrence. Since they held that all mankind was descended from a single

[1] See Topinard, 1878, p. 424.

pair (the question as to whether this pair were white, black, or red, occasioned a further discussion), they had to account for the subsequent divergence producing the present clearly-recognised varieties; and, in so doing, anticipated the theory of evolution, which was not clearly enunciated until the time of Lamarck.

Linnæus believed in fixity of species, but had doubts about the Biblical account. As a naturalist, he found it difficult to credit the exceptional nature of a country which had supplied the wants of zoölogical species as opposed to one another as the polar bear and the tropical hippopotamus.

Buffon ascribed the variations of man to the influence of climate and diet. Though Prichard and Lawrence both denied the possibility of the transmission of acquired characters, Prichard believed that the transmission of occasional variations might, to some extent, account for the diversities of races.[1] Lawrence wrote more

[1] In an essay entitled "A Remarkable Anticipation of Modern Views on Evolution," Professor E. B. Poulton draws attention to the ideas expressed in the first and second editions of the *Researches*, by Prichard, "one of the most remarkable and clear-sighted of the predecessors of Darwin and Wallace. . . . It is an anomaly that such works as the *Vestiges* should attract attention, while Prichard's keen insight, sound judgment, and balanced reasoning on many aspects of organic evolution, and especially on the scope of heredity, should remain unknown." *Essays on Evolution*, 1908, pp. 175, 192.

clearly: "Racial differences can be explained only by two principles—namely, the occasional production of an offspring with different characters from those of the parents, as a native or congenital variety; and the propagation of such varieties by generation." He considered that domestication favoured the production of these congenital and transmissible variations, and, anticipating the Eugenic school, deplored the fact that, while so much care and attention was paid to the breeding of domestic animals, the breeding of man was left to the vagaries of his own individual fancy.

**Lawrence.**

Sir William Lawrence (1783–1867) was appointed Professor of Anatomy and Surgery to the Royal College of Surgeons at the early age of thirty-two. His lectures on "Comparative Anatomy, Physiology, Zoölogy, and the Natural History of Man," delivered between 1816 and 1818, raised an immediate outcry; and the author (to use his own words) was charged "with the unworthy design of propagating opinions detrimental to society, and of endeavouring to enforce them for the purpose of loosening those restraints in which the welfare of mankind exists." Lawrence was forced to bow before the storm of abuse, and announce publicly that the volumes had been suppressed, as he was refused copyright. It is interesting to note that these lectures are

among those at present recommended for the use of students of anthropology.

Lawrence was far in advance of his time, and much of his teaching may be said to have anticipated the doctrine of evolution. Unfortunately, the theological protest raised by his lectures—published when he was only thirty-five—resulted in his forsaking anthropology altogether, and he henceforward devoted himself entirely to anatomy and surgery.

Another prophet in advance of his times was Lord Monboddo. James Burnett Monboddo (1714–1799) was regarded as one of the most eccentric characters of the eighteenth century, mainly on account of his peculiar views about the origin of society and of language, and his theories as to the relationship of man with the monkeys. He was deeply interested in all the current accounts of "tailed men," thus justifying Dr. Johnson's remark that he was "as jealous of his tail as a squirrel." Later students of his writings are less struck by these eccentricities, which afforded endless jests to the wags of the age, than by his scientific methods of investigation and his acute conclusions. He not only studied man as one of the animals, but he also studied savages with a view to elucidating the origin of civilisation.

**Lord Monboddo.**

Many other pre-Darwinian evolutionists might

be mentioned, but Professor Lovejoy's caution must be noted:

> The premature adoption of a hypothesis is a sin against the scientific spirit; and the chance acceptance by some enthusiast of a truth in which, at the time, he has no sound reason for believing, by no means entitles him to any place of honour in the history of science.[1]

The first to enunciate a coherent theory of evolution—that of Transformism or Transmutation—was Lamarck.[2]

**Lamarck.**

Lamarck (1744–1829) believed that species were not fixed, but that the more complex were developed from pre-existent simpler forms. He attributed the change of species mainly to physical conditions of life, to crossing, and especially to use or disuse of organs, which not only resulted in the modification, growth, or atrophy of some, but, under the stress of necessity, led to the formation of new ones. "*La fonction fait l'organe.*" He also held that changes produced in the individual as the result of environment were transmitted to the offspring. Organic life was traced back and back to a small number of primordial germs or monads, the offspring of spontaneous generation.

[1] *Pop. Sci. Monthly*, 1909, p. 499.

[2] De Maillet and Robinet had already outlined part of the Lamarckian doctrine.

Man formed no exception. He was the result of the slow transformation of certain apes.

Lamarck's views were first published in 1801, and were enlarged in his *Philosophie Zoölogique*, 1809.

Lamarck's chief opponent was Cuvier (1769–1832), Professor of Natural History and of Comparative Anatomy in Paris, who, besides being the recognised authority on zoölogy (his great book, *Le Règne Animal*, was long the standard work on the subject), was even more renowned as an anatomist. He upheld the theory of Catastrophe, of alternate destructions and regenerations, against the new theories of Transformism and Evolution.

**Cuvier.**

According to this widely accepted belief, the universe was subject to violent terrestrial revolutions, involving the destruction of all existing things and the total annihilation of all living beings belonging to the past epoch.

The theory was by no means new; it was current in the East in the thirteenth century. In a book written by Mohamed Kaswini on the wonders of nature, he tells the following tale:

> In passing one day by a very ancient and extremely populous city, I asked of one of the inhabitants who founded their city. He replied to me: "I know not, and our ancestors knew no more than we do on this point."

> Five hundred years afterwards, passing by the same place, I could not perceive a trace of the city. Inquiring of one of the peasants about the place when it was that the city was destroyed, he answered me: "What an odd question you put to me; this country has never been otherwise than as you see it now." I returned there after another five hundred years, and I found in the place of the country I had seen—a sea. I now asked of the fishermen how long it was since their country became a sea; and he replied that a person like me ought to know that it had always been a sea.. I returned again after five hundred years; the sea had disappeared, and it was now dry land. No one knew what had become of the sea, or if such a thing had ever existed. Finally, I returned once more after five hundred years, and I again found a flourishing city. The people told me that the origin of their city was lost in the night of time.[1]

Cuvier's position was supported by the evidence brought to France by Napoleon's scientific expedition to Egypt (1801). Here were seen numbers of mummified animals, probably dating back some three to four thousand years, but showing no appreciable difference from existing types. This was held to demolish the theory of evolution by proving the immutability of species.

Étienne Geoffrey Saint-Hilaire (1772–1844), the zoölogist on the Egyptian expedition, inter-

[1] Quoted from R. Knox, *Anth. Rev.*, i., 1863, p. 263.

preted the results differently, and was one of the most brilliant supporters of Lamarck. In 1828 he published his convictions that the same forms have not been perpetuated since the origin of all things, though he did not believe that existing species were undergoing modication. Cuvier returned to the charge, and propounded his doctrine of the periodical revolutions of the earth, of the renewal each time of the flora and fauna, and of the incessant and miraculous intervention of a creative Will. And for a time, owing to his position and authority, he held the field.

**Étienne Saint-Hilaire.**

In 1844 appeared a book which had an enormous influence on the pre-Darwinian history of Evolution. This was an anonymous work entitled *Vestiges of the Natural History of Creation*, the authorship of which was not revealed until the publication of the twelfth edition in 1884. It was the production of Robert Chambers (1802–1871), co-editor with his brother William of *Chambers's Journal*, and author of many books on Scotland and a few on science. He traced the action of general laws throughout the universe as a system of growth and development, and held that the various species of animals and plants had been produced in orderly succession from each other by the action of unknown laws

**Robert Chambers.**

and the influence of external conditions. The *Vestiges* became at once the centre of scientific discussion, denounced by the orthodox, and held "not proven" by most of the men of science of the time. Its supporters were called "Vestigiarian," a term which implied also "unscientific," "sentimental," and "absurd."

The curious point is that in the *Vestiges* we find much of what was subsequently called the Darwinian theory already enunciated. According to Wallace, it clearly formulated the conception of evolution through natural laws, and yet it was denounced by those who soon after were to become the champions of Darwinism. This was partly due to the way in which the doctrine was treated and expressed, partly also to the "needless savagery" of Professor Huxley.

Huxley wrote in 1887: "I must have read the *Vestiges* . . . before 1846; but, if I did, the book made very little impression on me. . . . I confess the book simply irritated me by the prodigious ignorance and thoroughly unscientific habit of mind manifested by the writer." Professor Lovejoy[1] explains the reasons for Huxley's attitude:—

> The truth is that Huxley's strongly emotional and highly pugnacious nature

[1] *Loc. cit.*

> was held back by certain wholly non-logical influences from accepting an hypothesis for which the evidence was practically as potent for over a decade before he accepted it as it was at the time of his conversion. The book was written in a somewhat exuberant and rhetorical style. With all its religious heterodoxy, it was characterised by a certain pious and edifying tone, and was given to abrupt transitions from scientific reasoning to mystical sentiment. It contained numerous blunders in matters of biological and geological detail; and its author inclined to believe, on the basis of some rather absurd experimental evidence, in the possibility of spontaneous generation. All these things were offensive to the professional standards of an enthusiatic young naturalist, scrupulous about the rigour of the game, intolerant of vagueness and of any mixture of the romantic imagination with scientific inquiry. . . . He therefore, in 1854, almost outdid the *Edinburgh Review* in the ferocity of his onslaught upon the layman who had ventured to put forward sweeping generalisations upon biological questions while capable of errors upon particular points which were palpable to every competent specialist.

Huxley refers to this review as "the only review I ever have had qualms of conscience about, on the grounds of needless savagery." Darwin more mildly described it as "rather hard on the poor author." Indeed, he confessed to a certain sympathy with the *Vestiges;* while Wallace, in

1845, expressed a very favourable opinion of the book, describing it as "an ingenious hypothesis, strongly supported by some striking facts and analogies."

The strongest testimony to the value of Chambers's work is that of Mr. A. W. Benn, who writes in *Modern England*, 1908, concerning the *Vestiges:*—

> Hardly any advance has since been made on Chambers's general arguments, which at the time they appeared would have been accepted as convincing, but for theological truculence and scientific timidity. And Chambers himself only gave unity to thoughts already in wide circulation. . . . Chambers was not a scientific expert, nor altogether an original thinker; but he had studied scientific literature to better purpose than any professor. . . . The considerations that now recommend evolution to popular audiences are no other than those urged in the *Vestiges*.

**Herbert Spencer.**

The next great name among the pre-Darwinian evolutionists is that of Herbert Spencer. About 1850 he wrote:—

> The belief in organic evolution had taken deep root (in my mind), and drawn to itself a large amount of evidence—evidence not derived from numerous special instances, but derived from the general aspects of organic

> nature and from the necessity of accepting the hypothesis of evolution when the hypothesis of special creation had been rejected. The special creation belief had dropped out of my mind many years before, and I could not remain in a suspended state: acceptance of the only possible alternative was imperative.[1]

This suspended state, the *tätige Skepsis* of Goethe, was just what Huxley was enjoying; in his own words, "Reversing the apostolic precept to be all things to all men, I usually defended the tenability of received doctrines, when I had to do with the transmutationists; and stood up for the possibility of transmutation among the orthodox."

Thus, up to the date of the publication of the *Origin of Species*, scientific opinion was roughly divided into two opposing camps: on one side were the classic, orthodox, catastrophic, or creationist party, who believed in the fixity of species, and that each species was the result of special miraculous creation; on the other, the evolutionists or transmutationists, who rejected special creation, and held that all species were derived from other species, by some unknown law.

It was the formulation of this unknown law

[1] Duncan, *Life and Letters of Herbert Spencer*, 1898, ii., p. 317.

that makes 1859 an epoch in the history of anthropology.

**Charles Darwin.**

Darwin's work may best be summed up in the words of his loyal and self-effacing co-worker, Alfred Russel Wallace:—

> Before Darwin's work appeared the great majority of naturalists, and almost without exception the whole literary and scientific world, held firmly to the belief that species were realities, and had not been derived from other species by any process accessible to us . . . [but] by some totally unknown process so far removed from ordinary reproduction that it was usually spoken of as "special creation." . . . But now all this is changed. The whole scientific and literary world, even the whole educated public, accepts, as a matter of common knowledge, the origin of species from other allied species by the ordinary process of natural birth. The idea of special creation or any altogether exceptional mode of production is absolutely extinct. . . . And this vast, this totally unprecedented, change in public opinion has been the result of the work of one man, and was brought about in the short space of twenty years.

Huxley describes the attitude towards the theory in the year following the publication of the *Origin of Species:* "In the year 1860 there was nothing more volcanic, more shocking,

more subversive of everything right and proper, than to put forward the proposition that, as far as physical organisation is concerned, there is less difference between man and the highest apes than there is between the highest apes and the lowest. . . . That question was not a pleasant one to handle." But the "horrible paradoxes of one generation became the commonplaces of schoolboys"; and the "startling proposition" of 1860 was, twenty years later, a "fact that no rational man could dispute."[1]

This question of the difference between man and the apes was embittered by the personal encounter between Huxley and Owen. Professor Owen, in 1857, stated that the *hippocampus minor*, which characterises the hind lobe in each hemisphere in the human brain, is peculiar to the genus *Homo*. This Huxley denied[2]; and, as neither disputant would acknowledge that he was mistaken, the question became "one of personal veracity."

As a possible explanation of this famous dispute, it is interesting to note the discovery announced by Professor D. J. Cunningham of the absence of this cavity on one side of the brain of an orang-outang, with the suggestion

[1] Add. Brit. Ass., 1878, Dublin.

[2] "It is not I who seek to base man's dignity upon his great toe, or to insinuate that we are lost if an ape has a *hippocampus minor*."—*Anth. Rev.*, i., 113.

that Owen "may in the first instance have been misled by an abnormal brain of this kind."[1]

The further history of the development, expansion, and curtailment of the Darwinian theory as such lies beyond the scope of this little book. The criticisms of sexual selection and of the origin of the higher mental characters of man by Wallace; the denial of the inheritability of acquired characters by August Weismann and others; the orthogenesis theory of Theodore Eimer, the "mutation" theory of Hugo de Vries and Mendel's researches—all opened up lively controversies, and the field of science is still clouded with the smoke of their battles.

The ferment provoked by the publication of Darwin's *Origin of Species* profoundly affected, as was natural, the nascent science of anthropology. At the meeting of the British Association in Nottingham in 1866 Dr. James Hunt read an address before the Anthropological Department to show that "the recent application of Mr. Darwin's hypothesis of 'natural selection' to anthropology by some of Mr. Darwin's disciples is wholly unwarranted either by logic or by facts."[2] In this address he said that he still believed the deduction he had made three years previously—"that there is as good reason for classifying the negro as a distinct species

[1] Cunn. Mem., ii., R.I.A., p. 128.

[2] *Anth. Rev.*, iv., 320.

from the European as there is for making the ass a distinct species from the zebra; and if, in classification, we take intelligence into consideration, there is a far greater difference between the negro and the European than between the gorilla and chimpanzee." He insisted that "anthropologists are bound to take the totality of the characteristics of the different types of man into consideration." "It is to be regretted, however," Dr. Hunt continues, "that there are many writers in Germany who have recently written as though the question of man's place in nature were settled"; but he is delighted to find that "Professor Carl Vogt is doing all he can to show the fallacy of the unity hypothesis." He quotes Professor Vogt as saying:

> This much is certain, that each of these anthropoid apes has its peculiar characters by which it approaches man. . . . If, in the different regions of the globe, anthropoid apes may issue from different stocks, we cannot see why these different stocks should be denied further development into the human type, and that only one stock should possess this privilege. The further we go back in history the greater is the contrast between individual types, the more opposed are the characters."

The controversies and discussions of this period were not confined to those who had

technical knowledge or scientifically trained minds. All sorts of people joined in the fray, mainly because they fancied that the new ideas were subversive of "revealed religion"; but it would serve no useful purpose to recall the false statements and bitter expressions that were bandied about. Some had merely a sentimental objection to the doctrine of evolution; but at the present day most people would subscribe to the declaration of Broca, who wrote: "Quant à moi, je trouve plus de gloire à monter qu'à descendre et si j'admettais l'intervention des impressions sentimentales dans les sciences, je dirais que j'aimerais mieux être un singe perfectionné qu'un Adam dégénéré."[1]

**The Negro's Place in Nature.**

Another controversy, which, though mainly political in origin, cleft the ranks of the anthropologists, arose from the slavery question. Clarkson had started his agitation for the abolition of the slave trade about 1782, and during the early years of the nineteenth century many unsuccessful attempts were made to bring the system to an end in America. In 1826 over a hundred anti-slavery societies were in existence, mainly in the middle belt of the States, while the Cotton States were equally unanimous and vehement in opposition. Feeling naturally ran high; riots, murders, lynchings, raids, and

[1] *Mémoires d'Anthropologie*, iii., p. 146.

general lawlessness characterised the agitation on both sides, and added fuel to the flames which finally dissolved the Union in 1860. In England the question was hotly debated, and popular feeling was excited by the speeches of Clarkson and Wilberforce, and, most of all, by the publication of *Uncle Tom's Cabin* (1852). Being mainly a question of race, anthropology was soon implicated, monogenists and polygenists naturally ranked themselves on opposite sides, and the Ethnological Society became a strong partisan of the philanthropists and abolitionists.

In the midst of the excitement James Hunt, Honorary Fellow of the Ethnological Society and President of the newly formed Anthropological Society, read (1863) his paper on "The Negro's Place in Nature."[1] In this he carefully examined all the evidence on the subject, physical and psychical, and arrived at the conclusion that "the negro is intellectually inferior to the European, and that the analogies are far more numerous between the ape and negro than between the ape and the European"; moreover, that "the negro becomes more humanised when in his natural subordination to the European than under any other circumstances," "that the negro race can only be humanised and civilised by Europeans," and "that European civilisation is not suited to the negro's require-

[1] *Mem. Anth.*, i., p. 1.

ments or character." An abstract of the paper was read by Dr. Hunt at the meeting of the British Association at Newcastle, 1863, where the presence of an eloquent coloured speaker enlivened the subsequent discussion.[1] A tremendous outcry greeted the publication of this paper, and tightened the tension on the already strained relations between the two societies. Fierce denunciations from Exeter Hall and the "broad-brimmed school of philanthropists" were matched by equally vehement applause from the opposing camp. When Dr. Hunt died, a few years later, the following obituary notice, extracted from a New York paper, appeared in the *Anthropological Review*,[2] under the heading "Death of the Best Man in England":

> We are pained to hear of the death of Dr. James Hunt, beyond doubt the best, or at all events the most useful, man in England, if not, indeed, in Europe. The man that leads all other men in knowledge essential to human well-being, that thus extends the bounds of human happiness, and best illustrates the wisdom and beneficence of the Almighty Creator to His creatures, is, *per se* and of necessity, the best man of his generation; and such a man was the late Dr. James Hunt of England. . . . Dr. Hunt, in his own clear knowledge and brave enthusiasm, was

[1] *Anth. Rev.*, i., p. 386. [2] January, 1870, p. 97.

> doing more for humanity, for the welfare of mankind, and for the glory of God, than all the philosophers, humanitarians, philanthropists, statesmen, and, we may say, bishops and clergy of England together. . . . His death at the early age of thirty-six is a great loss to England, to Christendom, to all mankind; for, though there are many others labouring in the same great cause, especially in France and Germany, there was no European of this generation so clear and profound in the science of humanity as Dr. Hunt.

A serious discussion of the anatomical and psychological relation of the Negro to the European is still to the fore, especially in the United States of North America. But even as late as 1900 a book was published in America with the following title, and we have been informed that it has had a very large sale in the Southern States:—

> The Negro a Beast; or, "In the Image of God." *The Reasoner of the Age, the Revelator of the Century! The Bible as it is! The Negro and His Relation to the Human Family!* The Negro a beast, but created with articulate speech, and hands, that he may be of service to his master—the White man. *The Negro not the Son of Ham*, neither can it be proven by the Bible, and the argument of the theologian who would claim such, melts to mist before the thunderous and convincing arguments of this masterful book. By Charles

Carroll, who has spent fifteen years of his life and $20,000.00 in its compilation. Published by American Book and Bible House, St. Louis, Mo., 1900.

The publishers are "convinced that when this book is read . . . it will be to the minds of the American people like unto the voice of God from the clouds appealing unto Paul on his way to Damascus."

This preposterous book could appeal only to the ignorant and bigoted, and we mention it merely as an extreme instance of the difficulties against which science has sometimes to contend when dealing with burning social questions.

The latest word on this subject is by Professor F. Boas, who believes that the Negro in his physical and mental make-up is not similar to the European. "There is, however, no proof whatever that these differences signify any appreciable degree of inferiority of the negro . . . for these racial differences are much less than the range of variation found in either race considered by itself. . . . The anatomy of the American negro is not well known; and, notwithstanding the oft-repeated assertions regarding the hereditary inferiority of the mulatto, we know hardly anything on the subject."[1]

[1] Franz Boas, "Race Problems in America," *Science*, N. S., xxix., p. 848, 1909.

The real problem in America is the mulatto, since "the conditions are such that the persistence of the pure negro type is practically impossible."

## CHAPTER IV

### The Unfolding of the Antiquity of Man

IGNORANCE and prejudice combined to assert that man was created a few thousand years ago in a state of physical perfection. The possibility of the discovery of fossil man was therefore inconceivable to most people, and those earlier writers who entertained the idea were generally inclined to deny it. Cuvier, limiting the age of the earth to the orthodox 6000 years, had stated that fossil bones of man did not exist. Moreover, up to the time of his death (1832) nothing had been found to disturb this generally received opinion.

**Fossil Man.**

More than a hundred years before (1726) Professor Scheuchzer, of Zürich, had discovered his famous "*Homo diluvii testis*"—"Man, witness of the Flood"—and had described it as a "rare relic of the accursed race of the primitive world," exclaiming piously: "Melancholy skeleton of an old sinner, convert the hearts of modern reprobates!" His fossil was proved later to be that of a gigantic salamander, and fossil man

was allowed to sleep for more than a century.

When the question was again raised, in the middle of the nineteenth century, evidence of human remains which had been hitherto disregarded assumed a new importance, and earlier finds were re-examined.

First there was the Cannstadt cranium, found in 1700 by Duke Eberhard of Würtemberg, which remained undescribed for 135 years in the Stuttgart Museum. Later it was claimed as belonging to the prehistoric "race," proofs of whose existence were so rapidly accumulating. In 1856 a fresh stimulus was given by the discovery of a cranium and some other remains in the Feldhofen Cave, at the entrance to a small ravine called Neanderthal, on the right bank of the river Düssel, in Rhenish Prussia.

**Cannstadt.**

**Neanderthal.**

This was the first discovery of remains of palæolithic man to receive serious attention. The skeleton was embedded in a hard, consolidated loam, but unfortunately was badly damaged by the workmen before it was extricated. By the intervention of Fuhlrott, the thigh bones, the upper bone of each arm, shoulder-blade, collar-bone, some fragments of ribs and the cranium, were rescued, and are now in the Rheinische-Antiquitäts' Museum at Bonn. When the remains were first exhibited by their discoverer at Bonn, doubts were freely

expressed as to their human character. Virchow pronounced his opinion that the cranium was diseased; in the long controversy which raged over this skull his wide pathological experience, his distrust of merely morphological considerations, his agnostic position with regard to the origin of species in general and of man in particular, led him, perhaps, to propound this extreme view. Broca declared it to be normal. Huxley recognised the skull as human, but declared it to be the most ape-like ever discovered; and he placed it below the Australian in type.

No absolute reliance could, however, be placed on the evidence of a single skull, and an imperfect one at that; but later discoveries served in the main to confirm Huxley's opinion.

**Spy.**

Another important find was that of two crania and other skeletal remains discovered in 1886 at Spy, in the Namur district, Belgium, by de Puydt and Lohest,[1] with an associated fauna which included the woolly rhinoceros, mammoth, cave bear, hyæna, etc., five out of the nine species being extinct.

**Other Finds.**

Since 1886 new discoveries of human remains have been made at short intervals in various parts of Europe, and these range in date from historic to prehistoric times, the oldest skulls having naturally the most interest.

[1] Fraipont et Lohest, *Arch. de Biol.*, vii., 1887, p. 623.

The very careful studies of these remains that have been made by numerous anatomists are of extreme interest to students, and their general conclusions will be found summarised in certain text-books; but the details are of a somewhat technical character. Suffice it to say that even as far back as the palæolithic period, when men used only chipped stone implements, there were several human varieties in Europe; and, though in their anatomical characters they were in some respects more animal-like than existing Europeans, they were scarcely more so than certain non-European races of the present day—such, for example, as the Australian. In all cases the skulls were unmistakably those of true men, but on the whole it may be said that the points in which they differed from more recent Europeans betrayed "lower" characters.

In order that the reader may appreciate what rapid progress is now being made in this direction, we give a brief account of the most recent discoveries of fossil man.

**Homo Heidelbergensis.**

In October, 1907, a lower jaw was found in a deposit of sand at Mauer, near Heidelberg. The teeth are typically human; but the chinless jaw, with its thick body, very broad and short ascending portion, and other special points, surpasses in its combination of primitive characters all known recent and ancient human jaws;

thus it is a generalised type from which they can readily be derived. It has been suggested that, as the jaw is neither distinctly human nor anthropoid, it is a survival from that remote ancestor from which there branched off on the one side the genus Homo, and on the other the genera of anthropoid apes. Dr. O. Schoetensack regards *Homo Heidelbergensis* as of early Pleistocene or late Pliocene age; but Dr. E. Werth[1] relegates it to the middle of the Ice Age.

**Homo Primigenius.**

In March, 1908, Herr Otto Hauser found a skeleton of a young man in the upper valley of the Vézère, Dordogne; the skull had a receding forehead, prominent jaws, and large orbits, surmounted by massive brow-ridges; the limbs were short. It was a distinct burial with associated objects which prove it to be of Mousterian age (p. 91, *n*).

Also of Mousterian age are the skeleton discovered in August, 1908,[2] and the skull in February, 1909, at La Chapelle-aux-Saints, Corrèze, and the skeleton exhumed in September in the latter year at Ferrassie, Dordogne, by M. Peyrony, who had previously discovered another skeleton of the same age at Peche de

[1] *Globus*, xcvi., 1909, p. 229.

[2] Bouysonnie et Bardon, *L'Anthropologie*, xix., 1908, p. 513.

l'Azé, near Sarlat, also in Dordogne. These two finds have not yet been described.

Compared with the short stature (5 ft. 3 in.) of the La Chapelle man, the skull is of remarkably large size. It is narrow, with a flattened cranial vault and enormous brow-ridges; the orbits are

Skull of the fossil man of La Chapelle-aux-Saints
After the restoration of the nasal bones and jaws. From *L'Anthropologie*, xx., 1909, p. 267; with the permission of Professor M. Boule.

large, and the face is very projecting. Professor Boule agrees with other investigators in regarding this skull as belonging to the Neanderthal-Spy type, and considers that the group is

distinct from all other human groups, living or fossil.[1]

As Professor Sollas points out, "the primitive inhabitants of France were distinguished from the highest civilised races, not by a smaller, but by a larger, cranial capacity; in other words, as we proceed backwards in time the human brain increases in volume."[2] We know that they buried their dead, and in some cases provided weapons and food for use in a future state. Their inventiveness is proved by the variety and gradual improvement in the technique of their tools and weapons. Their carvings in the round or low relief, their spirited engravings on bone and ivory, and their wonderful mural paintings, whether in outline, shaded monochrome, or polychrome, evince an astonishing æsthetic sense and technical skill.

As the diggers in Mesopotamia, Egypt, Greece, Crete, and elsewhere, have proved that civilisation was far more ancient than could have been conceived even fifty years ago, so the cave explorers have shown us that during the latter half of the palæolithic age there lived mighty hunters, skilful artists, big-brained men, who laid the foundations upon which subsequent

[1] M. Boule, *L'Anthropologie*, xix., 1908, p. 519; xx., 1909, p. 257. See also M. Alsberg, *Globus*, xcv., 1909, and H. Klaatsch, *Arch. für Anth.*, N. F. vii., p. 287.

[2] *Quart. Journ. Geol. Sci.*, vol. 66, 1910, p. lxii.

generations have built. This, then, is the lesson that the latest results of investigations into the antiquity of man have taught us—that brain, not brawn, has been the essential factor in the evolution of man. The human brain had developed at a greater rate than the body, which even then retained unmistakable evidence of man's lowly origin. How long had this evolution been progressing before Mousterian times?[1] The ruder stone implements of the Acheulian and Chellian epochs carry us an appreciable time backward; and if even some of the eoliths are artifacts, we can project tool-using man to yet earlier times. Then the record becomes blurred, as it is manifestly impossible to decide whether simple bruising of stones was caused by man or natural agencies.

[1] The terms Magdalenian, Solutrian, Aurignacian, Mousterian, Acheulian, Chellian, refer to various epochs of culture in palæolithic times, giving their sequence from the newest to the most ancient. These epochs are further subdivided by some investigators, and several, if not all of them, are connected by intermediate stages. In other words, the remains prove that a steady evolution in culture has taken place. Nowhere do all these layers occur in one locality, and the evidence of their order is a matter of stratigraphy (*i.e.*, it is essentially a geological method). Palæontology decides on the animal remains found in the beds. The human anatomist discusses the human remains, and the archæologist deals with the artifacts or objects made by man. The accurate determination of the order of the beds is obviously of fundamental importance.

But these investigations all fade into relative insignificance compared with the sensation caused by the discovery made by Dr. Dubois in Java in 1891. Dr. Eugene Dubois was a graduate of Leyden University, who, besides having some knowledge of geology and palæontology, had attained distinction in anatomy. Between 1890 and 1896 he was stationed in Java, as surgeon to the Dutch Indian army, and by order of the Government he conducted some explorations with a view to determining the fossil fauna which had been discovered in those parts many years before. While examining the beds attributed to the Pleistocene period below the dry season level of the Bengawan River, at Trinil, he found the teeth, calvarium, and femur of the now world-famous *Pithecanthropus erectus*. This was announced even in scientific journals as "The 'Missing Link' found at last." Dubois published his account in Java in 1894, and since that date a vast amount of literature has accumulated round the subject, representing the three antagonistic points of view. Some, like Virchow, Krause, Waldeyer, Ranke, Bumüller, Hamann, and Ten Kate, claim a simian origin for the remains; Turner, Cunningham, Keith, Lydekker, Rudolf Martin, and Topinard believed them to be human; while Dubois, Manouvrier, Marsh, Haeckel, Nehring,

**Pithecanthropus erectus.**

Verneau, Schwalbe, Klaatsch, and Duckworth ascribe them to an intermediate form. The last-mentioned sums up the evidence in these words: "I believe that in *Pithecanthropus erectus* we possess the nearest likeness yet found of the human ancestor, at a stage immediately antecedent to the definitely human phase, and yet at the same time in advance of the simian stage."[1]

The English, as Dr. Dubois somewhat slyly noted, claimed the remains as human; while the Germans declared them to be simian; he himself, as a Dutchman, assigned them to a mixture of both.

The geological horizon in which the remains of *Pithecanthropus erectus* were discovered is still an open question. Of late opinion seems to tend towards regarding it as belonging to the early Pleistocene instead of the Pliocene, to which it was at first referred.[2] After reviewing all the evidence concerning Tertiary man, Professor Sollas concludes:—"We have now reached the end of this summary, and find ourselves precisely where we were, having obtained

[1] W. L. H. Duckworth, *Morphology and Anthropology*, 1904, p. 520.

[2] "The lowest term of the human series yet discovered is represented by Pithecanthropus, and dates from some part of the Pleistocene epoch" (W. J. Sollas, *Science Progress*, 1908, p. 353). See also W. Volz, *Neues Jahrb. f. Mineral.*, 1907.

no evidence either for or against the existence of man in times previous to the great Ice Age" (*loc. cit.*, p. 350).

The discovery of these human remains has had a very noticeable effect on anthropometry. Most of them are imperfect, some very much so; as in the case, for example, of the partial calvaria of Pithecanthropus and of the Neanderthal specimen. The remains are of such intense interest that they stimulated anatomists to a more careful analysis and comparison with other human skulls and with those of anthropoids. As time rolled on, new ways of looking at the problems suggested themselves, which led to the employment of more elaborate methods of measurement or description. Almost every specimen of fossil man has led to some improvement in technical research; and the subject is not yet exhausted, as the character of the inner walls of the crania have not yet yielded all their secrets, more particularly in regard to the brains which they once protected. It would be tedious to enumerate the names of those who have studied even the two calvaria just mentioned, and impossible to record all of those who have advanced our knowledge of the anatomy of fossil man.

## CHAPTER V

### Comparative Psychology

At the present time the data for a comparison of the bodily functions of the members of one race with those of another are so scanty that the science of ethnical physiology can scarcely be said to exist. Fortunately, there is a quite different state of affairs for the study of the mind—or Psychology—though even in this field there is yet a great deal of work to be done.

During the eighteenth century the term "Anthropology," which was very vaguely employed, was often used to designate a comprehensive psychology dealing with the entire mental side of man, as well as the relations between soul and body. Later, as its scope became widened, the centre of gravity shifted over to physical man; but anthropologists have always maintained their right to deal also more or less with psychology.

Psychology in early times concerned itself with the essence of the soul as an independent entity, its relations to the body, its destructibility or indestructibility, and the laws of its

operations. The word "Psychology" has always had a vague and varying significance. Thus, when Hunt, in his presidential address before the Anthropological Society in 1866 said: "I am glad to know that there are many Fellows of this Society who are at present working on the psychological aspects of our science," he referred to the interest then taken by the members in the phrenology of the period. Later on, however, he expresses his opinion with regard to "modern phrenology" as being "wholly unscientific." The old phrenology is now practically dead.

**Phrenology.**

During the last quarter of the last century a study of various obscure mental states received a fresh impetus in England by the founding of the Society for Psychical Research. This society principally investigates (1) hypnotism, disorders of personality, automatic writing, and crystal-gazing, which are universally recognised by psychologists as furnishing fields for scientific study; and (2) thought-transference and its manifestations, which are not, however, at present generally accepted as facts.

**Psychical Research.**

> Though but recently crept forth, *vix aut ne vix quidem*, from the chill shade of scientific disdain, Anthropology adopts the airs of her elder sisters among the sciences, and is as severe as they to the Cinderella of the family,

> Psychical Research. She must murmur of her fairies among the cinders of the hearth, while they go forth to the ball, and dance with provincial mayors at the festivities of the British Association.[1]

The hypnotic and kindred practices of the lower races have until lately scarcely attracted the attention of anthropologists. Bastian in 1890 wrote a tract, *Ueber psychische Beobachtungen bei Naturvölkern*, and Tylor has also touched on the subject in *Primitive Culture;* but its main advocate is Andrew Lang, who declares: "Anthropology must remain incomplete while it neglects this field, whether among wild or civilised men," and "In the course of time this will come to be acknowledged."

If we turn now from popular to scientific notions of psychology, we discern the following methods and aims of the science. There are two methods—(1) the introspective, by which one's own mental states are observed; and (2) the objective, by which the conduct of others is observed: both may be studied without or under experimental conditions. It is very difficult to secure reliable introspection in backward peoples, and also to interpret the mental state of an individual by observing his behaviour.

**Methods and Aims.**

The objects of psychology are fivefold:—

[1] A. Lang, *Making of Religion*, p. 43.

1. The study of mind compared with non-mental processes.

2. The study of the mind of the individual compared with other minds.

3. The study of the normal mind of the individual compared with the abnormal.

4. The study of the mind of one race compared with that of other races.

5. The study of the mind of genus Homo compared with that of animals.

All these are of interest and value for anthropology, especially the second, fourth, and fifth.

In the earlier days of psychology, when the subject was in the leading-strings of philosophy, it had little ethnological value. Indeed, the possibility of such a subject as ethnological psychology was not realised.

**Ethnical Psychology.**

Ethnical psychology, the study of the mind of other races and peoples, of which, among the more backward races, glimpses can be obtained only by living among them and endeavouring to reach their point of view by means of observation and experiment, is a modern conception; and for this branch of the subject there is no history.

As an illustration of the change of attitude with regard to ethnical psychology during the last fifty years, we may quote from Burmeister[1] in 1853: "It is not worth while to look into the

[1] *Der Schwarze Mensch.*

soul of the negro. It is a judgment of God which is being executed that, at the approach of civilisation, the savage man must perish' ; and again,[1] in 1857: "I have often tried to obtain an insight into the mind of the negro, but it was never worth the trouble." Compare with this such works as R. E. Dennett's *At the Back of the Black Man's Mind*, 1906. In justification of his attempt to represent the basal ideas of the West African native, Dennett says: "I cannot help feeling that one who has lived so long among the Africans, and who has acquired a kind of way of thinking black, should be listened to on the off-chance that a secondary instinct, developed by long contact with the people he is writing about, may have driven him to a right, or very nearly right, conclusion" (pp. 133–4). And as the keynote of his elaborate investigation, which results in "crediting the Africans with thoughts, concerning their religious and political system, comparable to any that may have been handed down" to ourselves by our own ancestors, he quotes from Flora L. Shaw:[2] "It may happen that we shall have to revise entirely our view of the black races, and regard those who now exist as the decadent representatives of an almost forgotten

[1] *Reise nach Brasilien.*

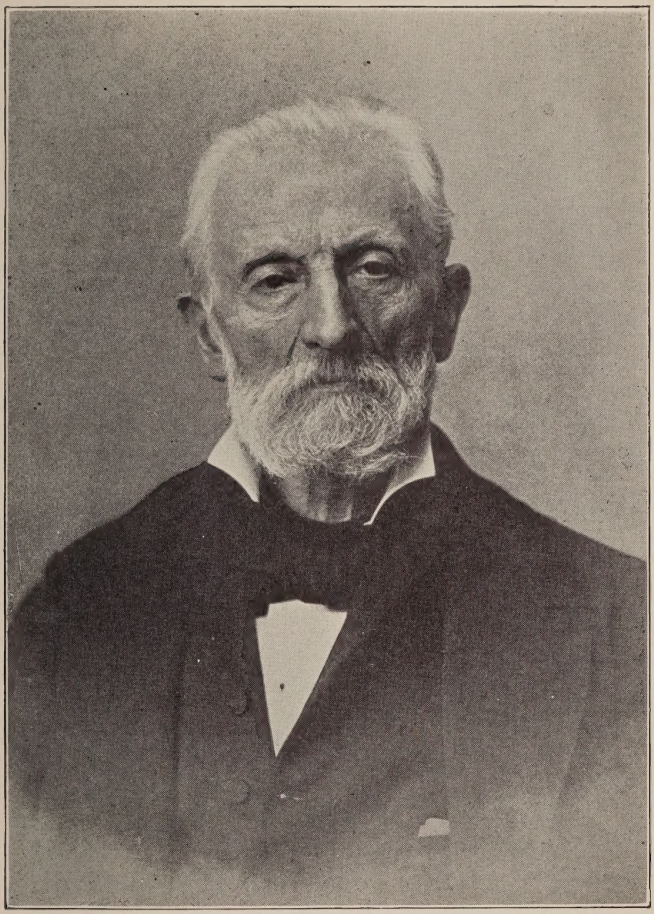
[2] Flora L. Shaw (Lady Lugard), *A Tropical Dependency*, p. 17.

era, rather than as the embryonic possibility of an era yet to come."

The earliest recognition of the anthropological aspect of psychology is found in Germany, where Bastian was always insisting on the essential connection between psychology and ethnology; and, although his own literary method was peculiarly obscure, he did a very great deal, both by his writings and personal influence, to stimulate the study of psychology from the point of view of ethnology.

**Bastian.**

Adolf Bastian (1826–1905), after passing through five universities—Heidelberg, Berlin, Jena, Würzburg, and Prague—began his life of travel in 1851 as a ship's doctor. The next twenty-five years were mainly spent in voyages of research in all parts of the world, and always with one object in view—the collection of materials for a comparative psychology, on the principles of a natural science. His first journey, which occupied eight years, resulted in the publication in 1860 of the first of a long series of writings. When not engaged in travel, his life was filled with his work in connection with the Berlin Museums. Great though these services were, Bastian's main interest was always concentrated on psychology. The ideas of folk psychology were in the air, and the study of *Welt-Anschauung*, or, to use Bastian's



P. W. A. Bastian.

phrase, *Völker-Gedanken*, was already inaugurated in Germany. To organise this study by introducing wide scientific, inductive, and comparative methods, and to collect evidence from among all the peoples of the earth, was Bastian's life-work, in which he was still engaged when death overtook him at Trinidad in 1905. Among the conceptions of the *Natur-Völker*—the "cryptograms of mankind," as he called them—he worked unceasingly, demonstrating first the surprising uniformity of outlook on the part of the more primitive peoples, and secondly the correlation of differences of conceptions with differences in material surroundings, varying with geographical conditions. This second doctrine he elaborated in his *Zur Lehre von den Geographischen Provinzen*, in 1886.

**Folk Psychology.**

The term "psychology of peoples" has become familiar of late, and books have been written on the psychology of special peoples, such as the *Esquisse psychologique des Peuples Européens* (1903), by A. Fouillée; but these are based on general considerations, and not on experimental evidence.

The place of comparative psychology in anthropology was officially determined in England by the request which the Anthropological Institute made to Herbert Spencer in 1875, to map out the comparative Psychology of

man, with a view to providing some sort of method in handling the various questions that came before the Institute. The result of this was Spencer's provisional Scheme of Character, in which the problem of measurement took an important place.

**Experimental Psychology.**

In the department of experimental psychology, Germany again took the lead. G. T. Fechner[1] attempted by means of laboratory tests to discover the law of connection between psychical and bodily events. A band of workers arose, and the new science spread to other countries. In England Sir Francis Galton took advantage of the International Health Exhibition at London, 1884, to install in the exhibition an anthropometric laboratory, in which a few psychological experiments were made on a large number of people, and since then he has frequently made arrangements for similar laboratories.

In nearly all of the larger universities experimental psychology is a recognised study, and almost every variety of mental condition is investigated. Professor W. Wundt, in his *Völkerpsychologie* (1904), has been a master-builder on these foundations.

The experiments in psychological laboratories were of necessity confined to subjects readily

[1] *Elemente der Psychophysik*, 1860.

accessible, who naturally were mainly Europeans or of European descent. A few observations had been made on aliens who, as a rule, had been brought from their native countries for show purposes; but in these cases the observations were made under unfavourable conditions so far as the subject was concerned. With the exception of these very few and unsatisfactory investigations, experimental psychology was mainly concerned with the subjects numbered 2, 3, and 5 in the table on p. 98.

A new departure was made in 1898 by the Cambridge Anthropological Expedition to Torres Straits. For the first time trained experimental psychologists (Drs. W. H. R. Rivers, W. McDougall, and C. S. Myers) investigated by means of an adequate laboratory equipment a people in a low stage of culture under their ordinary conditions of life. The foundations of ethnical experimental psychology were thus laid.

Professor R. W. Woodworth sums up the conclusions arrived at from his own observations and those of others as follows: "We are probably justified in inferring that the sensory and motor processes and the elementary brain activities, though differing in degree from one individual to another, are about the same from one race to another."[1]

Lately an attempt has been made, under the

[1] *Science*, xxxi., 1910, p. 179.

auspices of the Royal Anthropological Institute, to provide travellers with instructions for psychological investigations in the field.

During the last few years the subject of race improvement, or Eugenics, has been greatly to the fore, and it has been in England connected mainly with the name of Sir Francis Galton, who as long ago as 1865 published his views on the subject. Eugenics is officially defined in the Minutes of the University of London as "the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally." A eugenics laboratory has recently been established in University College, London, in connection with Professor Karl Pearson's biometric laboratory.

**Eugenics.**

## CHAPTER VI

### The Classification and Distribution of Man

**Race Description and Classification.**

After the age of race discrimination comes the age of race description and classification; and, as we should expect, this second stage is not reached until the close of the Dark Ages and the dawn of the Renaissance, when thought had been emancipated from the bondage of scholastic authority and stimulated by the new impulse which infected all forms of intellectual activity.

**Bernier.**

The first attempt at the classification of mankind was that of a French traveller, F. Bernier (1625–1688), whose scheme appeared in an anonymous article in the *Journal des Scavans*, 1684, entitled "A new division of the earth, according to the different species or races of men who inhabit it," etc.[1]

He distinguished "four or five species or races": (1) The inhabitants of Europe, North Africa (including the Egyptians), and a great

[1] See T. Bendyshe, *Mem. Anth. Soc.*, i., 1865, p. 360.

part of Asia (including the Indians). He notes that the Egyptians and Indians are black or copper-coloured, but considers the complexion to be due to climate. (2) The Africans, with thick lips, flat noses, and black skins, due not to climate but nature, with scanty beard and woolly hair. (3) The Asiatics not included in the first group, white, with "broad shoulders, a flat face, a small squab nose, little pig's-eyes long and deep-set, and three hairs of beard." (4) The Lapps, "little stunted creatures, with thick legs, large shoulders, short neck, and a face elongated immensely; very ugly, and partaking much of the bear; they are wretched animals." He hesitates whether to put the Americans or the inhabitants of South Africa, who are unlike the Negroes, into a fifth class. The latter are probably the Hottentots or Bushmen, in spite of his statement that "some of the Dutch say they speak *turkey*."

**Linnæus.**

The next classification was that of Linnæus. His service to anthropology by fixing the place of *Homo sapiens* in the animal kingdom has already been noted (p. 18). In the first edition of the *Systema naturæ* (1735),[1] man is classed as a quadruped, and together with the ape and sloth constitutes

[1] These accounts have been taken from the original editions; but the reader is referred to the verbatim copy given by Bendyshe in the *Mem. Anth. Soc.*, i., 1865, p. 421.

the order *Anthropomorpha*. Four varieties of Homo are recorded: *H. Europæus albesc.*, *Americanus rubesc.*, *Asiaticus fuscus*, *Africanus nigr.* In the second edition (1740), Homo is divided into the same four varieties, which are distinguished by the colour of their skin, located severally, one in each of the then known continents—*Europæus albus*, *Americanus rubescens Asiaticus fuscus*, and *Africanus niger*.

In the tenth edition (1758) more divisions are recognised: the genus Homo consists of two species—Sapiens, 1 H. diurnus. *Ferus*, including hairy men without speech who run about on all-fours, of which six records are given; *Americanus* (α) and *Europæus* (β), *Asiaticus* (γ), *Afer* (δ), *Monstrosus* (ε), which include (*a*) *Alpini* (small), *Patagonici* (large); (*b*) *Monorchides*—Hottentotti, *Junceæ*—Europæ; (*c*) *Macrocephali*—Chinenses, *Plagiocephali*—Canadenses. A second species being Troglodytes 2. H. nocturnus (Homo sylvestris Orang Outang). This classification was retained in the twelfth edition (1772). In these two latter editions the genera Simia, Lemur, and Vespertilio were classed with Homo in the order Primates.

In *Fauna Suecica*, published in 1746, Linnæus made a more detailed classification of the population of Sweden, recognising three main types, distinguished by their stature, hair, and eye colour. These were the Goths, tall, hair

white and straight, iris of the eyes ashen blue; Finns, with muscular body, hair long and yellow, and dark iris; and Lapps, with small, thin body, straight black hair, and iris blackish.

Blumenbach (1775) based his classification not only on skin colour, but also on skull form. To the four groups of Linnæus he added a fifth, dividing the one species into five varieties—the Caucasian, the Mongolian, the Ethiopian, the American, and the Malayan. The last group included the then little known Australian, Papuan, and pure Malay types.

**Blumenbach.**

Blumenbach was the originator of the unfortunate title "Caucasian"[1] to represent the typical European and the inhabitants of Eastern Asia and Northern Africa. He chose the name partly because the Caucasus produces the most beautiful race of men, and also on account of the fine Georgian skull in his collection.[2] It was unfortunate, since, as Ripley points out (1900, p. 436), nowhere else in Europe is found such a heterogeneity of physical types—the only one conspicuously missing being the fair-haired, blue-eyed European—and such a diver-

[1] *Anthrop. Treatises of Blumenbach*, translated by T. Bendyshe, 1865, pp. 265, 269.

[2] Waitz, 1863, p. 233, *f.-n.*, who adds: "without any intention on his part to express thereby an opinion as to the cradle of these peoples." Keane, 1896, p. 226.

sity of language, sixty-eight dialects being here jumbled together, and only one possessed of (possibly) Aryan origin. The name "Caucasian" has, therefore, not led to clarification of ideas in the complex problem of European ethnology. Keane (1899), however, supports its use, saying: "Those who object to Caucasic are apt to forget the vast field that has to be embraced by this single collective term." "Caucasic, when properly understood . . . cannot be dispensed with until a more suitable general term be discovered" (p. 447).

**Other Classifications.**

The next important classification was that of Cuvier, who derived mankind from the three sons of Noah, Japhet being regarded as the parent of the Caucasic, Shem of the Mongolian, and Ham of the African races. The divergence of type between the three brothers is not explained, except that the blackness of the descendants of Ham is attributed to the curse imposed by Noah on Canaan, the son of Ham (Gen. ix. 25).

Other classifications followed, the divisions varying from two species, white and black, Virey (1801), to the fifteen or sixteen of the Polygenists, Desmoulins (1825–6) and Bory de Saint-Vincent (1827), and the thirty-four of Haeckel (1873).

In America L. Agassiz, an uncompromising

opponent of Evolution, asserted, in 1845,[1] the unity of mankind as a species; but in 1850[2] we find him distributing eleven or twelve, in 1853 (in Nott and Gliddon) eight, human species in as many geological and botanical provinces. But this theory had been previously promulgated by Desmoulins (1826) and by Swainson (in 1835).[3] As Waitz rightly says: "They are completely in error who, adopting the views of Agassiz, assume as many original types of mankind as there are typically different peoples on the globe" (1864, p. 203).

It was not until the nineteenth century that a really scientific method of classification was adopted. In the majority of these schemes the character of the hair was chosen as the primary race-characteristic.

**Pruner Bey.**

The hair had already been studied by Heusinger (1822), by Blower, of Philadelphia, and by Kölliker, the histologist, before the publication of Pruner Bey's classic memoir, read before the Paris Anthropological Society in 1863, and published in the same year. Dr. Pruner Bey claimed that the quality of the hair constituted one of the best means of race-identification, and even that "a single hair presenting the average form char-

[1] Smith, 1850, *Unity of the Human Races*, p. 349.

[2] *Christian Examiner*, Boston, July, 1850.

[3] *Treatise on the Geography and Classification of Animals.*

acteristic of the race might serve to define it."

**Bory de St.-Vincent.**

Long before this, in 1827, Bory de Saint-Vincent had chosen the hair as the chief test in race-classification, and divided mankind into the *Leiotrichi*, or straight-haired, and the *Ulotrichi*, or woolly-haired—a nomenclature afterwards adopted by Professor Huxley (1870).[1] But Bory de Saint-Vincent's classification was robbed of permanent scientific value by his inclusion as distinct races of such vague abstractions as "Scythians," "Neptunians," and "Columbians."

**Isidore Geoffroy Saint-Hilaire.**

Isidore Geoffroy Saint-Hilaire (1858) distributed his eleven principal races primarily according to the character of the hair, subdivided according to the flatness or projection of the nose, skin-colour, the shape of the skull, and the character of the face.[2]

**Haeckel.**

Professor Ernst Haeckel adopted the following classification from Friedrich Müller:—I. Ulotriches (woolly-haired). *A*. Lophokomoi (tufted): Papuans, Hottentots; *B*. Eriokomoi (fleecy): Kafirs, Negroes. II. Lissotriches (lank-haired). *A*. Euthykomoi (straight): Malay, Mongol, Ameri-

[1] *Journ. Eth. Soc.* (N. S.), ii.

[2] *Cf.* Topinard, 1885, p. 264.

can, Arctic, Australian; *B.* Euplokomoi (curly): Dravidas, Nubians, Mediterranean.

Broca and Topinard (1885) have three main classes—Straight, Wavy or Curly, and Woolly—subdivided first by head-form, then by skin-colour.

**Broca, Topinard.**

Many of the earlier classifications were based on insufficient or erroneous evidence, and the general tendency has been to increase the divisions as the physical characters of the populations of the earth became gradually better known. Thus the twelve races of Haeckel in 1873 had advanced to thirty-four in 1879; the sixteen of Topinard in 1878 had grown to nineteen in 1885; and the thirteen races and thirty subdivisions of Deniker in 1889 were increased in 1900 to seventeen groups, containing twenty-nine races.

Sir William Flower (1831–1899), a distinguished zoölogist and physical anthropologist, in 1885[1] adopted the old threefold classification:—I. Ethiopian, Negroid, or Melanian. *A.* African or typical Negroes; *B.* Hottentots and Bushmen; *C.* Oceanic Negroes or Melanesians; *D.* Negritos. II. Mongolian or Xanthous. *A.* Eskimo; *B.* Typical Mongolian (including the Mongolo-Altaic and the Southern Mongolian groups); *C.* Malay; *D.* Brown Polynesians or Malayo-Polyne-

**Flower.**

[1] *Journ. Anth. Inst.*, xiv., pp. 378–393.

sians; *E.* American Indians (excluding the Eskimo). III. Caucasian or "White." *A.* Xanthochroi; *B.* Melanochroi. As Flower himself says, this scheme of classification, "in its broad outlines, scarcely differs from that proposed by Cuvier nearly sixty years ago. . . . Still it can only be looked upon as an approximation." Although he places skin-colour first, he tacitly admits its insufficiency as a main diagnostic character, and his three groups coincide with a classification based on the nature of the hair.

Among the later classifications a new tendency may be noted. The earlier schemes aimed at producing a series of water-tight compartments into which the races of the globe could be isolated. Further research, however, encouraged the growing conviction that a pure race is practically non-existent, and a different method had to be followed. This is described by Deniker (p. 284): "Taking into account all the new data of anthropological science, I endeavoured, as do the botanists, to form natural groups by combining the different characters (colour of the skin, nature of the hair, stature, form of the head, of the nose, etc.)." This results in the formation of seventeen ethnic groups, containing twenty-nine races, and these are ingeniously arranged (p. 289) in a two-dimensional grouping, to show their affinities,

**Deniker.**

which is a modification of his suggestive earlier scheme.[1]

The "pigeon-hole" system of classification, had, however, been discredited in the fourth edition of Prichard's *Natural History of Man*, edited and enlarged by Edwin Norris (1855), since on p. 644 it is stated:—

> The different races of men are not distinguished from each other by strongly-marked, uniform, and permanent distinctions as are the several species belonging to any given tribe of animals. All the diversities which exist are variable, and pass into each other by insensible gradations; and there is, moreover, scarcely an instance in which the actual transition cannot be proved to have taken place.

This is practically the same result at which Waitz arrived in 1863.

Professor Keane (1895, p. 228), though returning to the fourfold grouping proposed by Linnæus, uses these divisions to represent, not actual varieties or races, but "ideal types," differentiated by somatic characters, and also by language, religion, and temperament. "Although man had but one origin, one pliocene precursor [Pithecanthropus], men had several separate places of origin, several pleistocene precursors. In our family tree four

**Keane.**

[1] *Bull. Soc. d'Anth.*, 1889.

such precursors are assumed." From each "ideal type" he traces the development of the present varieties arranged in the scheme of the family tree.

**Man's Place in Nature.**

Since the time of Linnæus it has been recognised that a place for man must be found in the classification of animals; and he was naturally put at the top of the tree. The main question, however, was his exact relationship to the higher apes. Linnæus (See p. 107) included man and apes in the Primates, one of his seven orders of Mammalia. Cuvier divided the Mammifères into nine groups, man being included in the Bimanes, and apes and monkeys in the Quadrumanes. The most noteworthy attempt to put man in his place was made when Huxley published his *Evidence as to Man's Place in Nature* (1863), based on lectures given in 1860, in which he proved that man was more nearly allied to the higher apes than the latter were to the lower monkeys. Concerning this book, he wrote to Mr. E. Clodd, thirty years later, "that a very shrewd friend of mine [Sir William Lawrence[1]] implored me not to publish, as it would certainly

[1] In the Preface to the 1894 edition Huxley writes: "It was not so very long since my kind friend Sir William Lawrence, one of the ablest men whom I have known, had been well-nigh ostracised for his book *On Man*, which now might be read in a Sunday-school without surprising anybody."

ruin all my prospects."[1] Doubtless one reason why Huxley wrote the book was to impress on the public that the evolution of man as an animal is perfectly comparable with that of other mammals, since Darwin only hinted in his *Origin of Species* (1859) that "Light will be thrown on the origin of man and his history" (p. 488). His silence, he confesses in the Introduction to the *Descent of Man* (1871), was due to desire "not to add to the prejudices against his views." Professor Haeckel fully discussed his views concerning the genealogy of man in 1868,[2] and several times subsequently.

Carl Vogt (1864), who, like so many other zoölogists then and since, was led to study anthropology, pointed out that "the ape-type does not culminate in one, but in three, anthropoid apes." On examining the species of mankind and their history, he arrived at similar results. (See also p. 77.)

**Vogt.**

In the second volume of his *Generelle Morphologie* (1866), Haeckel applied the theory of evolution to the whole organic kingdom, including man, and drew up the first "genealogical trees." This attempt was improved and treated in a more popular form in his *Natural History of Creation* (1868), and again in the *Evolution of*

[1] *Folk-Lore*, vi., 1895, p. 67, *f.-n.*

[2] *Naturliche Schöpfungsgeschichte.*

*Man* (1879), an enlarged edition of which was published in 1905.

There is now a practical agreement among zoölogists and anthropologists that man is included in one of several families that constitute the sub-order Anthropoidea of the order Primates.

As has previously been mentioned, the discovery of *Pithecanthropus* raised great discussions, some of which were concerning the exact position of man with regard to the various higher apes. It is now generally admitted that *Pithecanthropus* may be regarded as a member of a separate family of the Anthropoidea, the Pithecanthropidæ, between the Simiidæ and the Hominidæ. The re-examination of the previously known skulls of palæolithic age, and the discovery of fresh specimens in recent years, have re-opened the question whether the genus Homo contains more than the one species, *H. sapiens*. Duckworth[1] (1904) has given a careful summary of the morphological characters of the Neanderthal, Spy, and Krapina remains, and states as his opinion that "the individuals thus characterised are associated in a group specifically distinct from the modern Hominidæ, to which the name *Homo primigenius* or *Homo neanderthalensis* has been applied."[2]

[1] *L.c.*, pp. 520–542; *cf.* also *Man*, 1902, p. 186.

[2] See also W. J. Sollas, *Phil. Trans. Roy. Soc.*, B. 199, 1907, p. 281.

Those authors who describe and classify the various races and peoples of mankind at the same time indicate their geographical distribution, and in some instances notify some of the shiftings and migrations that have taken place. Many maps have been prepared to illustrate the human distribution in whole or in part, and these are to be found in various memoirs and books. An atlas such as Dr. G. Gerland's *Atlas der Völkerkunde* (1892) summarises a vast amount of information.

Our knowledge is very imperfect concerning the movements of mankind. Historical records give some information on the subject. A certain amount has been gleaned from traditional sources, but doubtless much more remains to be garnered. The spoils of the archæologist afford important data, but there are immense tracts of country which are yet totally unexplored, or very imperfectly investigated. All shiftings of peoples are mainly controlled by climatic and geographical conditions; but these are continually varying, and it is the business of the geographer and geologist to indicate what these have probably been at various periods since the appearance of man on this earth. It is not too much to say that, when maps have been prepared which indicate these various changes, great light will be thrown upon the early history of mankind.

## CHAPTER VII

### Ethnology: Its Scope and Sources

"ETHNOLOGY" is a term which is often loosely used as synonymous with "Anthropology," to cover the whole field of the science of man. It was in this sense that it first came into prominence, being chosen by M. W. F. Edwards as the title for the *Société ethnologique de Paris*, in 1839. The society was concerned with what we should now call anthropology; but it was more especially interested in the origins and relationships of the historical races of Europe, which was the etymological justification for its name. The English Ethnological Society, established in 1843, imitated the French title, and did much to fix the vague and general interpretation of the word. Unfortunately, Professor Tylor, first and foremost of English ethnologists, seems purposely to avoid the use of the word in his *Primitive Culture*, which he refers to as "rational ethnography." But, with the development of the subject, its scope became gradually more defined, until it is now generally

**Definition.**

restricted to the comparative and genetic study of human culture and of man as a social animal.

The materials for the study of ethnology have been always with us, but the study itself is of very recent development, and almost alone among the sciences can reckon its founders among the living. Professor J. L. Myres gives excellent reasons for this "late adolescence" in his opening address at the meeting of the British Association at Winnipeg, 1909:—

> Anthropology . . . gathers its data from all longitudes, and almost all latitudes, on this earth. It was necessary, therefore, that the study of man should lag behind the rest of the sciences, so long as any large masses of mankind remained withdrawn from its view; and we have only to remember that Australia and Africa were not even crossed at all—much less explored—by white men, until within living memory, to realise what this limitation means. In addition to this, modern Western civilisation, when it did at last come into contact with aboriginal peoples in new continents, too often came, like the religion which it professed, bringing "not peace, but a sword." The customs and institutions of alien people have been viewed too often, even by reasonable and good men, simply as "ye beastlie devices of ye heathen," and the pioneers of our culture, perversely mindful only of the narrower creed, that "he that is not with us is against us," have set out to civilise savages by

wrecking the civilisation which they had (pp. 589–590).

There are, as Professor Myres points out, two kinds of anthropologists:

**Sources.**

> There is an anthropologist to whom we go for our facts: the painful accurate observer of data, the storehouse of infinite detail; sometimes himself the traveller and explorer, by cunning speech or wiser silence opening the secrets of aboriginal hearts; sometimes the middleman, the broker of traveller's winnings, insatiate after some new thing, unerring by instinct rather than by experience, to detect false coin, to disinter the pearl of great price. . . . To him we go for our facts. . . .
>
> And there is an anthropologist to whom we look for our light. His learning may be fragmentary, as some men count learning; his memory faulty; his inaccuracy beyond dispute; his inconsistency the one consistent thing about him. But with shattered and rickety instruments he attains results; heedless of epicycles, disrespectful to the equator, he bequeaths his paradoxes to be demonstrated by another generation of men. He may not know, or reason, perhaps; but he has learnt to see; and what he sees he says (1908, p. 124).

**Herodotus.**

In the earliest times Herodotus may be cited as one of the most distinguished names in the former of the two groups, and Lucretius in the latter. The writ-

ings of Herodotus (*circa* 480–425 B.C.) are a veritable storehouse of information, from the highest civilisations down to the veriest savagery, and his work has lost none of its freshness or value through lapse of time. As a matter of fact, modern investigations carried out in the areas treated of by him more frequently confirm and exemplify than refute his statements.

Lucretius (99 or 98–55 B.C.), the poet, teacher, and reformer, boldly declared that there was no Golden Age from which man has degenerated, but that his progress has continually been slowly upward from a condition of pure savagery:

**Lucretius.**

> Arms of old were hands, nails and teeth and stones and boughs broken off from the forests, and flame and fire, as soon as they had become known. Afterwards the force of iron and copper was discovered; and the use of copper was known before that of iron, as its nature is easier to work and it is found in greater quantity. With copper they would labour the soil of the earth, with copper, stir up the billows of war. . . . Then by slow steps the sword of iron gained ground and the make of the copper sickle became a byword; and with iron they began to plough through the earth's soil, and the struggles of wavering war were rendered equal.[1]

[1] Lucretius, *On the Nature of Things*. Translated by H. A. J. Munro. Bohn's edition, 1908, p. 214.

It is evident from his poems that Lucretius was a keen observer and a philosopher, who summed up existing Epicurean knowledge; and we are justified in believing that these particular generalisations were based upon tales told by travellers in distant lands, and upon traditional lore, which, with the exception of the recently acquired archæological evidence, is practically all upon which we have to rely. The philosophic poet apprehended the significance of various facts, and welded them into a consistent theory of the development of culture, and thereby earned the honour of being the first evolutionary anthropologist.

**Strabo.**

Nor should we overlook the versatile Strabo (*circa* 63 B.C.–21 A.D.), who was interested in many things, from climate to botany, and from sport to Druidism and Brahmanism. Alexander von Humboldt considered that he surpassed all other geographical labourers of antiquity by the diversity of the subject and the grandeur of the composition. His *Geography* contains much information on the early history and traditions of numerous peoples, their character, dress, dwellings, and mode of life.

In the writings of the earlier travellers (to mention but three names)—Marco Polo, in Cathay (1254–1323), Ibn Batuta (1304–1377), in Asia, and Joao de Barros (1496–1570), who

was considered the greatest authority on Portuguese African and Asiatic travels of his time —and in the records of travels contained in collections such as those of Hakluyt (1552–1616), Purchas (1577–1626), and Pinkerton (1758–1826), much ethnological information can be sifted from among the marvellous tales. Sometimes the marvellous tales themselves can, by ethnology, be interpreted in fact, as when the "tailed men" of the Nicobars are found to owe their origin to the tail-like method of wearing the loin-cloth.[1] These were followed by the travellers and explorers of the nineteenth century, who brought back a vast amount of new information, both physical and cultural, from the lands they visited. Among these the names of Admiral Byron, James Bruce, L. A. Bougainville, Sir John Barrow, Captain Cook, de Lesseps, and Pallas may be mentioned.

Other sources of information were the works of the Jesuit missionaries of the sixteenth to the eighteenth centuries, such as José d'Acosta (1539–1600), J. F. Lafitau (1670–1740), and F. X. de Charlevoix (1682–1761), who worked among the Canadian Indians, and M. Dobrizhoffer (1717–1791).

Next come the missionaries of the nineteenth century, such as William Ellis (1794–1872), who laboured in South Africa and Madagascar,

[1] E. H. Man, *Journ. Anth. Inst.*, xv., p. 442.

but is best known for his work in Polynesia; John Williams (1796–1839); George Turner (1818–1891); W. Wyatt Gill (1828–1896), and others who also worked in the Pacific. In Africa we may mention Bishop Callaway (1817–1890) and David Livingstone (1813–1873). At the same time the Roman Catholic missionary E. R. Huc (1813–1860) was working in China and Tartary, while the Abbé Dubois (1770–1848) was laboriously investigating the manners, customs, and ceremonies of the Hindus.

Besides the missionaries, we owe a deep debt of gratitude to the early explorers and civil servants in all parts of the world, who have provided, consciously or unconsciously, a vast amount of information about the peoples among whom they travelled or over whom they ruled. Scientific expeditions, even before these were undertaken in the interests of anthropology, collected further material. Lastly come the various anthropological expeditions, consisting of trained workers, who, besides amassing fresh evidence, check, correct, or amplify the work of earlier writers.

These were the data on which the science of ethnology, in its restricted sense, was to be built. The earliest ethnologists utilised the material mainly with a view to elucidating ethnic relationships, and to producing systematic classifications of the various races of

mankind. Later workers such as Ratzel and Reclus produced systematic descriptions of races, peoples, and areas. A third method was that of Tylor, the chief exponent of Comparative Ethnology.

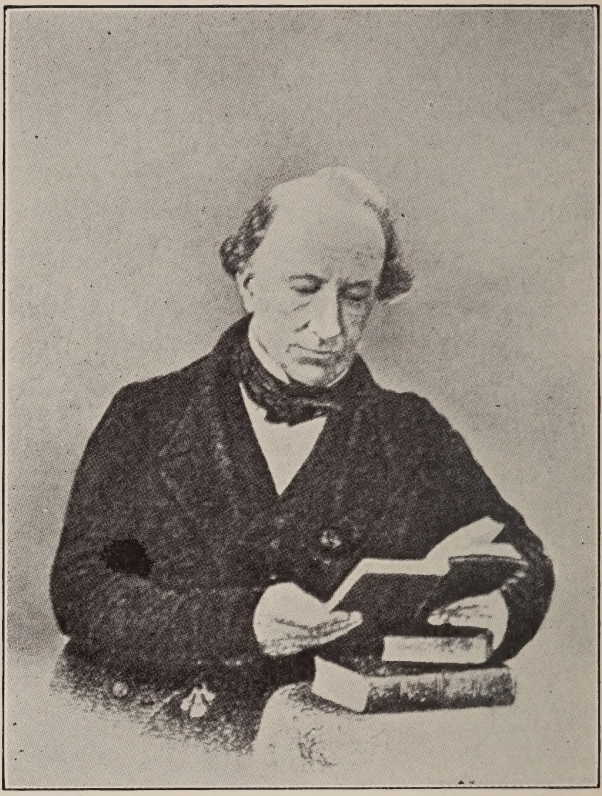
**Systematic Works on Ethnology.**

The earlier attempts at race classification were based merely on physical characters, and are dealt with elsewhere (Chap. VI.). During the eighteenth and early part of the nineteenth centuries geographical discovery brought a mass of new facts to light, especially in the realm of natural history; and in no branch of that science were the effects so marked as in that of anthropology.

The marshalling of a vast array of new observations and deductions required a broad mind, wide knowledge, and shrewd reasoning powers. These, together with a sound training in anatomy, an unusual acquaintance with philology, and some eminence in psychology, produced the monumental work of Prichard.

**Prichard.**

James Cowles Prichard (1786–1848) showed, when a boy, a remarkable aptness for foreign languages. He was never sent to school, but was taught by various tutors, from whom he learnt Latin, Greek, French, Italian, and Spanish. His father, a merchant, and member of the Society of Friends, lived for a time in Bristol, and there



J. C. Prichard.

the boy began his practical study of anthropology, spending his time by the docks, watching the foreign sailors, and chatting with them in their own tongues. Later on he chose medicine for his profession, less on account of any special liking for it than because it afforded him opportunities for indulging his anthropological tastes. His first contribution to the science was his thesis for the degree of Doctor of Medicine in the University of Edinburgh, which was entitled *De generis humani varietate*, published in 1813 in an expanded form as *Researches into the Physical History of Man*. It was still further expanded in 1826, and a five-volume edition was issued between 1836 and 1847. In 1843 appeared another monumental work, *The Natural History of Man*, "comprising inquiries into the modifying influence of physical and moral agencies on the different tribes of the human family."

Speaking of Prichard at the meeting of the British Association in Bristol in 1875, Professor Rolleston remarked: "His works remain, massive, impressive, enduring—much as the headlands along our southern coast stand out in the distance in their own grand outlines, while a close and minute inspection is necessary for the discernment of the forts and fosses added to them—indeed, dug out of their substance in recent times." The services of Prichard in the

field of anthropology have often been compared with those of his contemporary Blumenbach, by whose fame during his lifetime he was overshadowed; but, though the latter was unequalled on the side of physical anthropology, there is no doubt that Prichard had a wider grasp of the subject, and his works formed the cornerstones of anthropology in England.

**Other Generalisations.**

While Prichard was expanding his thesis, Antoine Desmoulins was writing his *Histoire naturelle des races humaines*, which appeared contemporaneously with Prichard's revised *Researches* in 1826. He attempted to discover the origins and relations of the peoples of north-east Europe, north and east Asia, and South Africa, by the evidence of archæology, physiology, anatomy, and linguistics.

The work of systematising the mass of anthropological data and producing an orderly scheme must always be regarded as an almost superhuman task, and those who have attempted it deserve our grateful recognition.

The next Englishman after Prichard was Latham, who published his *Natural History of the Varieties of Man* in 1850 (the same year as Knox's *Races of Man*), and his *Descriptive Ethnology* in 1859. In the latter year appeared the first instalment of the *Anthropologie der Naturvölker* of Waitz, the six volumes of which were

completed in 1872—a work which largely assisted in laying a secure foundation for the new science. In 1873 Friedrich Müller published his *Allgemeine Ethnographie*. The following year saw the publication of Peschel's *Völkerkunde*. Ratzel's great work, *Völkerkunde*, appeared in 1885–88. In America Pickering's *Races of Man* was published in 1848, and Nott and Gliddon's *Indigenous Races of the Earth* in 1857. Paul Topinard's *L'Anthropologie* (1876) is mentioned elsewhere (p. 41).

The earlier of these generalisations were composed before the acceptance of the theory of Evolution, in the new light of which all biological sciences had to start afresh, and all were written before the masses of new material collected by ethnologists and archæologists, working in the field, had brought so much fresh evidence to bear upon the whole geographical and historical aspect of man that it was impossible "to see the wood for the trees." Thus the time for synthesis had arrived, and with the hour came the man. A. H. Keane's *Ethnology* appeared in 1896, to be followed by his *Man, Past and Present*, in 1899. J. Deniker's *Les races et les peuples de la terre*, together with the English translation, appeared in the following year.

In summarising the sources from which the materials for the science of ethnology are

derived, stress must be laid on the contributions from classic authors. No student can afford to neglect the histories, annals, poems, and sacred books of the ancients, whether African, European, or Asiatic. Professor J. L. Myres (1908) has pointed out that anthropological investigations and speculations were already afoot in the fifth century B.C. and before, and has outlined the ethnological problems concerning man, his origin and relationships, and the questions connected with his social life that interested and puzzled the ancient Greek world. Not only Herodotus, but other writers, show that these problems were thoroughly familiar to the Greeks. Long before Herodotus, Hesiod refers to a standard scheme of archæology, in which Ages of Gold, Silver, and Bronze succeed each other; primitive man is described as a forest dweller growing no corn, but subsisting on acorns and beech mast; Anaximander and Archelaus have suggestions to solve the mystery of man's origin, Anaximander taking an "almost Darwinian outlook"[1] of the animal kingdom; Æschylus distinguishes the tribes of men by culture, noting the differences in their dress and equipments, religious observances and language.

**Ethnology and the Classics.**

[1] This statement is criticised by E. E. Sikes in *Folk-Lore*, xx., 1909, p. 424.

The chief value of the Greeks to the ethnologist is that they were collectors of material. Some of their theories have been substantiated, but they arrived at conclusions by deduction rather than by induction.

Thus in many ways anthropology owes a deep debt of gratitude to the classics. It was not until recently that this debt began to be repaid.

Within the last twenty or thirty years there has been an increasing recognition of the value of anthropological studies in the elucidation of the classics; and this healthy movement is mainly associated with the name of Professor William Ridgeway, of Cambridge, who devoted his presidential address before the Royal Anthropological Institute, in 1909, to this subject.

In 1887, Professor Ridgeway proceeded to apply the comparative method to Greek coins and weights in a paper called the "Homeric Talent: Its Origin and Affinities."[1] He there tried to show that the origin of coined money among the Lydians, and its evolution by the Greeks and Italians, entirely accorded with the evolution of primitive money from the use of objects such as axes, ornaments, cattle, and so forth.

[1] *Hellenic Journal*, viii., p. 133; see also *The Origin of Metallic Currency*, 1892.

One of the relations of ethnology to other branches of the Humanities which hitherto has received scant acknowledgment is its influence on the course of Political Science. Professor J. L. Myres recently gave a brilliant address on this subject at Winnipeg, in which he points out how Bodin (1530–1596), Edward Grimstone (1615), Thomas Hobbes (1588–1679), John Locke (1632–1704), Montesquieu (1689–1755), Rousseau (1712–1778), Voltaire (1694–1778), Herder (1744–1803), and others, referred to or utilised the accounts of natives by travellers to illustrate their theories of statecraft.

## CHAPTER VIII

### The History of Archæological Discovery

DR. JOHNSON was not in advance of his time in anthropological matters. While he was gibing at Lord Monboddo for his belief in man's simian affinities, he was also making a pronouncement on the subject of prehistoric archæology that later discoveries were soon to disprove. Up to his time history was content to start from the earliest written documents, supplemented, now and then, by the evidence of coins and inscriptions; and Dr. Johnson summed up contemporary opinion in his statement: "All that is really known of the ancient state of Britain is contained in a few pages. We can know no more than what old writers have told us."

**Prehistoric Man.**

But it was not long before it was recognised that there was other evidence besides that of the "old writers," evidence the nature of which has been well described by Sir W. R. Wilde:

We possess what cannot be falsified by

> the scribe, and, although styled prehistoric, they are far more truthfully historical than the writing that no doubt was largely interfered with, and which, if old, now requires a gloss to interpret it. The grassy mound or circle, the stones erected into a cromlech, the great sepulchral mound, the cinerary urn, the stone weapon or tool, the grain-rubber for triturating cereal food, the harpoon for spearing fish, the copper and bronze tools and weapons, and the gold ornaments of the most early tribes—all are now, in their way, far more truthful than anything that could have been committed to writing, even if there were letters in that day. They are litanies in stone, dogmata in metal, and sermons preaching from the grassy mound.[1]

Much of this evidence already existed, but even when rightly interpreted it was for a long time ignored and scoffed at. It has been noted in the life-history of a scientific truth, "People first say, 'It is not true,' then that 'It is contrary to religion,' and lastly that 'Everybody knew it before.'" The first attitude of incredulity was to a great extent justified by the doubtful character of the earlier finds, many of which later investigation has had to reject or to hold in suspense as "not proven." The second stage was more serious, and for a long time the new science was hampered by the accusation of irreligion. But "Anthropology," as Huxley

[1] Brit. Ass., Belfast, 1874.

pointed out, "has nothing to do with the truth or falsehood of religion." "*Je suis naturaliste*," said Abbé Bourgeois, "*je ne fais pas de théologie*."

Gradually the accumulated evidence became too insistent to be ignored. The work of various archæologists in Denmark, the explorations of caves and lake-dwellings in Britain and on the Continent, and the patient labours of Boucher de Perthes in the Somme Valley, all gave proof of the existence of prehistoric man, and the science of prehistoric archæology was established.

**Flint Implements.**

Long before the time, as far back as the sixteenth century, flint implements had been discovered in various parts, and proved as great a puzzle as the fossils which perplexed and tried the faith of the earlier geologists.

The uncultured folk of Europe recognised that the chipped arrow-heads which occasionally occur on the surface of the ground were the implements of an alien people, as the names "elf darts" and "fairy darts" imply. The country folk in the more backward districts believe that fairies still exist; but better informed intelligent people believe they are purely mythological, while students are aware that these arrow-heads were the implements of earlier populations, who are classed in folk-memory under the generic term of "fairies."

Typical Neolithic implements, such as stone

adze and axe heads, had attracted the attention of writers in the Middle Ages, such as Gesner and Agricola, who, as Sir John Evans[1] informs us, regarded them as thunderbolts—a belief which is still widely spread not only in Europe, but over the greater portion of the Old World. But Mercati, physician to Clement VIII. at the end of the sixteenth century, appears to have been the first to maintain that what were regarded as thunderbolts were the arms of a primitive people unacquainted with the use of bronze or iron. Certain later writers, as de Boot (1636) and la Peyrère (1655), also regarded them as of human workmanship. Buffon, too, in 1778, declared the "thunder-stones" to be the work of primeval man.

In 1797 John Frere found numerous flint implements at a depth of about twelve feet in some clay pits at Hoxne, Suffolk, and referred them to "a very remote period indeed, even beyond that of the present world, and to a people who had not the use of metals."[2]

But the discovery does not seem to have attracted any interest, or raised any discussion; and the Hoxne implements lay unnoticed for more than half a century, until Evans, returning from Amiens and Abbeville in 1859, recog-

[1] *Ancient Stone Implements*, 1872; 2nd ed. 1897, chap. iii.
[2] *Archæologia*, xiii., p. 204.

nised the importance of the collections, and by further excavations proved their antiquity.

The belief of the Middle Ages, that everything inexplicable was the work of the Devil, was succeeded by an ascription of all objects of unknown antiquity to the Druids or the Romans; but to neither of these could be attributed the finds which were being made at the beginning of the nineteenth century in the Danish kitchen-middens and dolmens, in the Swiss lake-dwellings, and in the caves and gravels of Britain and of France. Still many years were to pass, and many heated discussions were to be held, before archæology came to be recognised as an ally of anthropology, and prehistoric man obtained credence.

**Denmark.**

In this new science Denmark took the lead. In 1806 a commission was appointed to make a scientific investigation into the history, natural history, and geology of the country; and among the first problems to be met with were the dolmens and shell-mounds, abounding in stone implements, which found no period in Danish history capable of accommodating them. History and the sagas were searched in vain. Meanwhile more and more of these prehistoric implements were brought to light. A new commission was appointed, and the various sites were carefully examined. The collection

of Professor R. Nyerup formed, in 1810, the nucleus which, in 1816, expanded into the Royal Danish Museum of Antiquities at Copenhagen, now, as the National Museum, lodged in the Princessen Palace. C. J. Thomsen held the post of curator from 1816 to 1865. He ordered, arranged, and classified the collections, dividing the objects according to their epoch of culture, and setting them in chronological order, establishing the sequence of the Stone, Bronze, and Iron Ages. This was the first attempt to classify the archæological contents of a museum on a chronological basis, and it was continued, elaborated, and developed by his successor, Professor J. J. A. Worsaæ, 1865 to 1885.[1]

**Caves.**

Another class of evidence which was of great importance in determining the pre-history of man was that derived from the caves. The beginnings of cave-exploration are described by Professor Boyd Dawkins:

> The dread of the supernatural, which preserved the European caves from disturbance, was destroyed in the sixteenth and seventeenth centuries by the search after "ebur fossile," or unicorn's horn, which ranked high in the materia medica of those days as a specific for many diseases, and

[1] The classification itself was not new; it had been adumbrated by many writers. See Evans, 1872, pp. 3 ff.

> which was obtained, in great abundance, in the caverns of the Hartz, and in those of Hungary and Franconia. As the true nature of the drug gradually revealed itself, the German caves became famous for the remains of the lions, hyænas, fossil elephants, and other strange animals, which had been used for medicine.[1]

These caves were investigated mainly by geologists or palæontologists, searching for evidence as to the extinct animals that formerly occupied them. Indications of the presence of man were unsuspected, and, if found, disregarded. Thus much of the evidence of man's early history was doubtless unwittingly destroyed.

The Franconian caves were explored towards the end of the eighteenth century, and described by Esper (1774), Rosenmüller (1804), and Dr. Goldfuss (1810). The most famous of these was the cave of Gailenreuth. Here, for the first time, investigations were carried out systematically, the finds classified, and, since they indicated the co-existence of man and extinct mammals, theories as to their significance and derivation filled the air.

In 1861 William Buckland (1784–1856), Professor of Mineralogy at Oxford (afterwards Dean of Westminster), visited the caves, and kindled that interest in cave-exploration which

[1] *Cave Hunting*, p. 11.

was to produce such remarkable results in England.

In the same year the first bone-cave systematically explored in the country was discovered at Oreston, near Plymouth, and the deposits proved the former existence of the rhinoceros in that region.

**Oreston.**

More famous was the exploration of the Kirkdale Cave, near Helmsley, in Yorkshire, discovered in 1821, in a limestone quarry, and investigated and described by Dr. Buckland. He found remains of the broken and gnawed bones of the rhinoceros, mammoth, stag, bison, etc., which had been the prey of the hyænas inhabiting the cave, and he traced their origin to a universal deluge. Subsequently he examined the remains from other caves, and summarised his conclusions in *Reliquiæ Diluvianæ*, published in 1824. Dr. Buckland was henceforward the acknowledged authority on bone-caves and their contents, and to his disbelief in the contemporaneous existence of man with the cave animals may be traced much of the incredulity with which all evidence of early man in Britain was received for more than a generation.

**Kirkdale.**

So far but few traces of man's presence in the caves had been detected, and, when found, had generally been explained away as later intrusions,

[1] *Phil. Trans. Roy. Soc.*, 1882.

though human occupations had been proved in Franconia, in the French caves explored by MM. Tournal de Christol and Marcel de Serres in the south of France in 1828, and later by the discoveries of Dr. Schmerling in the caves of Liège about 1832.

**Liège.**

From the forty caves examined Dr. Schmerling found not only bones of extinct animals, but also a few human bones, and a large number of bone and flint implements and flakes, which he attributed to human workmanship. Unfortunately, these discoveries were discredited both by Dr. Buckland and Sir Charles Lyell, but have since been fully substantiated by Dr. E. Dupont.[1]

**Kent's Cavern.**

The most important of all the cave explorations in England is that of Kent's Cavern, Torquay. This cavern was known from time immemorial; but the first investigation recorded was that of Mr. Northmore, of Cleeve, Exeter, who visited it in 1824, in expectation of finding evidence of the worship of Mithras.

The next year he returned there again, accompanied by the Rev. J. MacEnery, the Roman Catholic chaplain at Tor Abbey, whose name will always be honourably connected with the explorations of the cave. He was not a geologist or a palæontologist, but to him fell

[1] *Les Temps Antéhist. en Belgique*, 1871.

the distinction of discovering the first flint implement ever found in unmistakable association with remains of extinct animals. On another occasion he visited the cave together with Mr. Northmore and Dr. Buckland. "Nothing remarkable was discovered that day, excepting the tooth of a rhinoceros and a flint blade. This was the first instance of the occurrence of British relics being noticed in this or, I believe, any other cave. Both these relics it was my good fortune to find."

He subsequently found many other flint implements, but Dr. Buckland was not convinced that they occurred in an undisturbed area. He believed that the ancient Britons had scooped out ovens in the stalagmite, and that through them the flint implements had reached their position in the cave earth. In 1846 the Torquay Natural History Society appointed a committee of investigation, consisting of Pengelly and two others, who confirmed MacEnery's discovery of flint implements in conjunction with extinct animals. Nevertheless, their evidence was not accepted. In Pengelly's words: "The scientific world . . . told us that our statements were impossible, and we simply responded with the remark that we had not said they were possible, only that they were true."[1]

[1] *Kent's Cavern*, 1876. Lecture delivered at Glasgow (1875).

Before chronicling the final triumph of the cave explorers in 1859, we may briefly note another series of investigations which was being carried on at the same time, and which also shared in the work of throwing light on the shadowy figure of prehistoric man. This was the excavation of crannogs and lake dwellings.

**Lake Dwellings.**

In 1839, Sir W. R. Wilde explored some of the Irish crannogs, or semi-artificial islands, usually made of layers of stone, logs, sticks (the so-called fascine dwellings), resting on *cluans* or islets in the Irish lakes. The first crannog explored was that at Lagore, famous in ancient times as Loch Gobhair, near Dunshaughlin, Co. Meath, and mentioned in the *Annals of the Four Masters* as having been plundered in the ninth and tenth centuries. It was originally discovered by accident. Some labourers, when clearing out a stream in the neighbourhood, came across very numerous bones, and also a vast collection of objects of all descriptions, warlike and domestic, made of stone, bone, wood, bronze, and iron, and a few human remains.

**Irish Crannogs.**

The next crannog to be disclosed was one in Roughan Lake, near Dungannon; and thereafter more and more came to light, until in 1857 forty-six had been recorded.

The crannog finds, and the depth of the

deposits, indicated great age; and Sir William Wilde at once recognised their significance in determining the history of early human occupation in the island. This evidence was strengthened by the discoveries shortly afterwards made in Switzerland.

**Swiss Pile-Dwellings.**

These were also partly the result of an accident. The winter of 1853–4 happened to be particularly cold and dry, and in consequence tracts of the shores of the Swiss lakes, which were normally covered by water, stood bare and dry. The inhabitants of Ober Meilen, near Zürich, took advantage of this to enclose part of the foreshore, building walls, and filling the reclaimed space with mud. During the necessary excavations various remains came to light, stumps of piles, stone and horn implements, etc. Dr. Ferdinand Keller, President of the Antiquarian Society at Zürich, hearing of these discoveries, hastened to explore the newly-revealed area. Fishermen had long before reported on the existence of a submerged forest, the stumps of which caught their fishing nets and spoilt the fishing on the sloping shores. In 1829, during excavations, some piles were found, but, being attributed to the Romans, no further notice was taken of them. Dr. Keller discovered that the "submerged forest" was in reality of human origin, formed of sharpened

and pointed piles, driven into the ground at regular intervals, and he recognised here evidences of prehistoric human occupation, corresponding with that recently proved for Denmark. Pile dwellings were subsequently discovered in the lakes of Biel, Sempach, Neufchâtel, Geneva, and Wallenstad, though investigations were only carried out in Biel and Zürich. These yielded animal remains, numerous stone implements, pottery, a skull, parts of several skeletons, and one piece of bronze.

At first the evidence was merely ignored, then it was listened to, but discredited, or various ingenious explanations were made to explain it away.

But gradually the accumulated evidence became too insistent to be ignored, and was supported by names too great to be neglected. The caves of the Mendips, explored by Williams and Beard, of North and South Wales, explored by Stanley, of Yorkshire and of Devonshire, the crannogs of Ireland and the pile dwellings of Switzerland, all told the same tale.

The turning point was reached in 1858. During that year a new cave had been discovered while excavating for building foundations at Brixham, on the shores of Torbay. Mr. Pengelly persuaded the owner to grant him a refusal of the lease of the virgin site, and it was submitted to a most careful

**Brixham.**

examination. Thirty-six rude flint implements were discovered in association with the remains of hyænas, cave, brown and grizzly bears, woolly rhinoceros and mammoth, in undisturbed red loam beneath a layer of stalagmite.

This was conclusive evidence. A paper read by Mr. Pengelly at the meeting of the British Association at Leeds, 1858, and supported by such authorities as Charles Lyell, Ramsey, Prestwich,[1] Owen, and others, clinched the argument, and the contemporary existence of man with Pleistocene fauna was firmly established.

It was not long before the same concession of the antiquity of man was reached on the Continent.

**Boucher de Perthes.**

Boucher de Perthes, the son of a distinguished botanist, was early attracted to the work of cave exploration, and in 1805 and again in 1810 made discoveries of animal bones and of flint implements which he recognised as the work of man. Later on, when extensive excavations for fortifications and railroads were being carried on at

[1] "It was not until I had myself witnessed the conditions under which these flint implements had been found at Brixham that I became fully impressed with the validity of the doubts thrown upon the previously prevailing opinions with respect to such remains in caves."—Prestwich, *Phil. Trans. Roy. Soc.*, 1860.

Abbeville, he found the same type of implement *in situ*, and in 1838 submitted some of his discoveries and deductions to the Society of Emulation of Abbeville, of which he was president. The next year he brought the same evidence to Paris and showed his flints to several members of the Institute. In 1847 he published a description of his finds. In 1855 Rigollot,[1] by his finds at Amiens, had confirmed the evidence produced by Boucher de Perthes.

In 1858, Hugh Falconer, the palæontologist, visited Abbeville to see the collection of implements made by Boucher de Perthes, and "became satisfied that there was a great deal of fair presumptive evidence in favour of many of his speculations regarding the remote antiquity of these industrial objects, and their association with animals now extinct."[2] Acting on Falconer's suggestion, numerous geologists visited Abbeville in the following year, including Sir Joseph Prestwich, Sir John Evans, and Sir Charles Lyell; and Arthur J. Evans, then a boy accompanying his father, had the good fortune to find one of the chipped flints *in situ*. This established the horizon of the flints beyond question, though there were still some who disputed the human workmanship. The English

[1] *Mémoire sur des Instruments en silex trouvés à St. Acheul près Amiens.*

[2] *Palæont. Mem.*, ii., p. 597.

archæologists and geologists, however, had already been convinced by the evidence of the Devonshire caves, and the acceptance of "Palæolithic man" on the Continent dates from their visit.

**Subsequent Progress of Archæology.**

Thenceforward archæology made greater progress abroad than in Great Britain, mainly, perhaps, on account of the more numerous materials for study.

**France.**

To indicate the share that France has had and maintains in the elucidation of prehistoric anthropology, we have only to mention the work of É. Lartet with Mr. Henry Christy on the French caves of Aurignac (1861) and Périgord (1864); A. J. L. Bertrand and G. Bonstetten on dolmens (1864, 1865, and 1879); É. Rivière on the Mentone caves (1873); and the numerous works of E. Chantre, especially with regard to the Rhone basin. These and others prepared the way for the classic work of G. de Mortillet (1883), whose masterly summary and methodical treatment of the subject have been of great service to all subsequent workers. While recognising the labours of other investigators, special mention must be made of Judge E. Piette (1827-1906), whose excavations in the cave of Mas d'Azil constitute a landmark in such studies. Professor E. Cartailhac, Dr. Capitan, and l'Abbé H. Breuil have done further service in

their investigations in French caves; and the two latter, in their beautiful memoir on the cave of Altamira in North Spain, have further demonstrated the wonderful artistic sense and technique of the cave-dwellers during the later phases of Palæolithic times.

In Britain we may note the names of J. Barnard Davis, J. Thurnam, Rolleston, Sir Charles Lyell, Sir John Evans, Canon Greenwell, and Professor Boyd Dawkins, whose standard works have largely helped to mould the course of archæology in our own country.

In Germany, among the earlier writers may be mentioned C. Fuhlrott, L. Lindenschmidt (1864–1881), J. A. Ecker (1865–1870), A. Lissauer, and, above all, Rudolf Virchow, the author of numerous and valuable contributions.

Elsewhere, G. Nicolucci studied prehistoric man in Italy, and during the last thirty years the investigations of the illustrious Dr. Oskar Montelius, of Stockholm, have been valued by all archæologists.

**Tertiary Man.**

Boucher de Perthes was the vindicator of Quaternary man in France; l'Abbé Bourgeois stands as the protagonist on behalf of Tertiary man.

The first discovery of any traces of man's existence during Tertiary times was made in some sand and gravel quarries at Saint Prest,

near Chartres, by M. Desnoyers in 1863. He found various incised bones bearing evidence of human workmanship, together with remains of *Elephas meridionalis* and *Rhinoceros leptorhinus*. But Sir Charles Lyell gave it as his opinion, on examining the beds, that they were rather late Quaternary than true Tertiary.

The whole question was hotly debated at the Second Congress of Archæology and Prehistoric Anthropology at Paris, in 1867, where l'Abbé Bourgeois (1819–1878), Professor of Philosophy at Blois, exhibited his famous flint implements from Miocene beds at Thenay, near Tours, Loir-et-Cher. These were undoubtedly Miocene beds, but it was open to doubt if the implements were of human origin, and, if so, if they were found in undisturbed positions. At the *Congrès International d'Anthropologie* at Brussels in 1872 a committee of fifteen was formed to discuss the problem, and opinions were divided. Nine authorities recognised human workmanship (one changed his opinion later); four denied it; one was favourable, but with reserve; and one was unable to decide at all. De Mortillet believed that they had not been made by man himself, but by a semi-human precursor of man, which he named *Homosimius Bourgeoisii*.

Other finds of Tertiary man, those of the

Upper Miocene, by C. Ribeiro, at Otta in the Tagus Valley, 1860; of Tardy in the same year, and of Rames in 1877, in beds of the same horizon at Puy-courny, Auvergne; of Capellini, in Pliocene beds of Monte Aperto, near Siena, and of Fritz Noetling in Lower Pliocene beds in Burma, 1894, have none of them been received without question, and are still classed by most authorities, as by Sir John Evans in 1870, and again in 1897, as "Not proven."

Closely connected with the question of Tertiary man is the "raging vortex of the eolith controversy," as Sollas describes it. Benjamin Harrison, of Ightham, Kent, first drew attention to these rude chipped flints, which he found in the chalk plateau, and claimed to be of preglacial age, and of human origin. Prestwich accepted this view; Evans rejected it, and anthropologists are still divided into opposite camps on the question. Eoliths have since been discovered in various parts of the world, and have merely served to confirm the respective points of view of the partisans on either side.

**Eoliths.**

Sollas, after summing up all the evidence, says: "When experts are thus at variance nothing remains for the layman but to preserve an open mind." These discussions as to the existence of Quaternary and Tertiary man would have been settled once for all had actual

undoubted human bones been found in any of the beds, but this was rarely the case, and disputants had to rely almost entirely on questionable artifacts.

## CHAPTER IX

### Technology

THE history of that branch of Ethnology which is concerned with the handicrafts of man is very brief. Specimens of the arts and crafts of various races had long been collected in museums, and till recent years they were little more than curiosities or trophies; but, owing to the inspiration of General Pitt-Rivers, they are now proofs of stages in the evolution of human thought or handicraft, or links in a chain of scientific argument indicating the migrations or contacts of peoples.

**Pitt-Rivers.**

Augustus H. Lane-Fox (1827–1900) served with distinction in the Crimea. In 1851 he began to collect specimens to illustrate his views. This, it will be remembered, was eight years before the publication of the *Origin of Species*. So Lane-Fox was to all intents and purposes a pre-Darwinian evolutionist. Few men have had the collecting instinct so strongly developed, but there was invariably some principle or theory that the ob-

jects he collected were designed to illustrate. The spoils of over twenty years of intelligent collecting were exhibited in 1874 in the Bethnal Green Museum. The collection was a revelation to students, and was the first application of the theory of evolution to objects made by man. Colonel Lane-Fox succeeded to vast estates in Wiltshire and Dorsetshire in 1880, and assumed the name of Pitt-Rivers. The following year he commenced the series of excavations on his estate which are models of scientific "digging." The Pitt-Rivers Museum at Oxford, and that at Farnham in Dorsetshire, are fitting monuments of his genius. The curator of the former museum, Mr. H. Balfour, is ably carrying on the methods of Pitt-Rivers, and has made valuable investigations on the evolution of musical instruments and other implements.

Otis T. Mason (1838–1908), of the United States National Museum, paid particular attention to the implements and processes of the technology of backward peoples, more especially of the aborigines of North America; and he was also interested in the wider aspects of human industrial development.

Pitt-Rivers was certainly one of the first to demonstrate that patterns and designs may be studied from the point of view of evolution; but he did not make any detailed studies in this direction. The first systematic treatise in

this fascinating field of investigation was by Dr. H. Colley March, who, in *The Meaning of Ornament* (1889),[1] utilised certain views put forward by Gottfried Semper in his valuable book *Der Stil* (1860–1863); but for over a decade the distinguished Swedish archæologist and ethnologist, Dr. Hjalmar Stolpe (1841–1905), had been amassing data to illustrate the evolution and distribution of ornamentation, and he published a memoir on Polynesian art in 1890, which was followed by one on American art in 1896. Dr. C. H. Read,[2] Mr. H. Balfour (1893),[3] and others worked on similar lines, and much valuable research in this direction has also been accomplished by American and German ethnologists.

[1] *Trans. Lanc. and Cheshire Ant. Soc.*, 1889.
[2] *Journ. Anth. Inst.*, xxi., 1891, p. 139.
[3] *Evolution of Dec. Art.*

# CHAPTER X

## Sociology and Religion

THOSE branches of cultural anthropology which deal with comparative sociology and magico-religious data are sometimes designated as "Ethnology." It frequently happens that students who have written upon these and closely allied subjects have in the same book treated the archæological, technical, and linguistic aspects of cultural anthropology or ethnology in the larger sense. It is, therefore, impossible to keep to a precise classification of the subject when dealing with it historically.

**Comparative Ethnology.**

The main stumbling-block in the way of comparative ethnology was the difficulty of establishing the study on a firm scientific basis. "Man cannot be secluded from disturbing influences and watched like the materials of a chemical experiment in a laboratory."[1] Ethnologists were accused of basing their conclusions on the most fragile evidence, collected from most untrustworthy sources:

[1] Lang, 1898, p. 39.

> Anything you please . . . you may find among your useful savages. . . . You have but to skim a few books of travel, pencil in hand, and pick out what suits your case. . . . Your testimony is often derived from observers ignorant of the language of the people whom they talk about, or who are themselves prejudiced by one or another theory or bias. How can you pretend to raise a science on such foundations, especially as the savage informants wish to please or to mystify inquirers, or they answer at random, or deliberately conceal their most sacred institutions, or have never paid any attention to the subject? (*l.c.*, p. 41).

To remove this reproach was the work of Professor Tylor.

**Edward Burnett Tylor.**

It is difficult to express in adequate terms what Professor E. B. Tylor has done for ethnology. He is the founder of the science of Comparative Ethnology; and his two great works, *Early History of Mankind* (1865) and *Primitive Culture* (1871), while replete with vast erudition, are so suggestive and graced by such a charming literary style and quiet humour that they have become "classics," and have profoundly influenced modern thought. From their first appearance it was recognised that a master-mind was guiding the destinies of the nascent science. Some idea of the magnitude and diversity of his work may be gathered from

the bibliography of 262 items, published between 1861 and 1907, collected by Miss Freire-Marreco, *Anthropological Essays Presented to Edward Burnett Tylor in Honour of his Seventy-first Birthday, Oct. 2, 1907*. An appreciation of the labours of Professor Tylor is given by Andrew Lang in this volume. The true significance of the aims of "Mr. Tylor's Science," as Max Müller called it, may be best gathered from Professor Tylor's own words:

> For years past it has become evident that the great need of anthropology is that its methods should be strengthened and systematised. The world has not been unjust to the growing science, far from it. Wherever anthropologists have been able to show definite evidence and inference, for instance, in the development series of arts in the Pitt-Rivers Museum at Oxford, not only specialists, but the educated world generally, are ready to receive the results and assimilate them into public opinion. Strict method has, however, as yet, only been introduced over part of the anthropological field. There has yet to be overcome a certain not unkindly hesitancy on the part of men engaged in the precise operations of mathematics, physics, chemistry, biology, to admit that the problems of anthropology are amenable to scientific treatment. It is my aim to show that the development of institutions may be investigated on a basis of tabulation and classification.

This is the opening of a masterly paper "On a Method of Investigating the Development of Institutions; applied to Laws of Marriage and Descent."[1]

The tabular method is not applicable to much of the vast mass of material with which Tylor dealt; but the accuracy and systematising of method are found throughout, and were of invaluable service to a science peculiarly attractive to the vague speculator and enthusiastic *dilettante*.

Tylor (1871) insisted on the necessity of sifting and testing all the evidence, relying to a great extent on "the test of recurrence," or of undesigned coincidence in testimony; he says:

> The more odd the statement, the less likely that several people in several places should have made it wrongly. This being so, it seems reasonable to judge that the statements are in the main truly given, and that their close and regular coincidence is due to the cropping-up of similar facts in various districts of culture. Now the most important facts of ethnography are vouched for in this way" (2d ed., 1873, p. 10).

A further stimulus to the study of Comparative Ethnology in this country was given by the publication of Sir John Lubbock's (Lord Avebury's) *Origin of Civil-*

**Avebury.**

[1] *J. A. I.*, xviii., 245, 1889.

*isation* (1870), and opened the eyes of a large public to the interest of ethnology and its value in throwing light upon the earlier stages of culture of civilised peoples.

**Sociology.**

The question as to the influence of environment on the development of social organisation is as old as the world's oldest thinkers, and finds expression in Aristotle and in Plato, though Sociology, as a science, is a product of the last century. The word "Sociology" was first used by Auguste Comte (1798–1857), who showed its aim to be to discover the nature, the natural causes, and the natural laws of society. With the development of natural science came the insistence on a naturalistic interpretation of social differences, demonstrated by Guyot (1807–1884) and Draper (1811–1882), and overemphasised by Buckle (1821–1862).

**Comte-Buckle.**

Comte's method was that of deductive construction and prescription. Buckle's plan was to evolve a social science inductively through a study of history, with the help of economics and statistics. His *History of Civilisation* answers the great question which he sets himself: "Are the actions of men, and therefore of societies, governed by fixed laws, or are they the result either of chance or of supernatural interference?" He attempted to show how

"Climate, Food, Soil, and the General Aspect of Nature" were the dominant influences in early societies, determining the food supply, the degree of population, and the economic condition.

Unfortunately, in pursuit of this idea Buckle was apt to overlook the influences of culture-contact, and of economic factors; thus deserving to some extent, the censure of Jevons: "Buckle referred the character of a nation to the climate and the soil of its abode."[1] At the same time Buckle must be regarded as the first historical sociologist of the modern scientific movement.

The evolutionist explanation of the natural world as applied to sociology found its fullest exponent in Herbert Spencer (1820-1903), who studied the anatomy of the social frame. He derived the principles of sociology from the principles of psychology and of biology, and regarded social development as a super-organic evolution.

**Herbert Spencer.**

But all these earlier attempts to discover a social science were speculative rather than practical. The solid foundations of inductive sociology were laid by Bachofen, Morgan, J. F. McLennan, and others.

Bachofen (1861) was the first to study the system of filiation through the mother, or mother-right, which was widely distributed among ancient peoples, and still occurs in many

[1] *Letters and Journal of Stanley Jevons*, 1866, p. 454.

regions in a more or less developed condition. McLennan frankly states that "the honour of that discovery the importance of which, as affording a new starting-point for all history, cannot be overestimated, must, without stint or qualification, be assigned to him" (1876, p. 421). Independently, however, J. F. McLennan (1827–1881), in his *Primitive Marriage* (1865), arrived at the conclusion "that the most ancient system in which the idea of blood-relationship was embodied was a system of kinship through females only."[1] He points out more than once that "Mr. Maine seems not to have been able to conceive of any social order more primitive than the patriarchal."[2] This book was reprinted with additions in 1876, and his two other books were published posthumously (1885, 1896). In these and more fugitive writings McLennan was a keen controversialist, and with unnecessary vigour and animus attacked Morgan, Sir Henry Maine, and Dr. Howitt. McLennan's attitude may be partly explained by the fact that he was a lawyer and a theorist, but he possessed great enthusiasm, with which he infused those who came into contact with him, and his labours served to advance the study of sociology.

**Bachofen, Morgan, McLennan, and others.**

[1] P. 124 of 1876 ed.

[2] P. 181, *ibid.*

> "From the time of Plato downwards, theories of human society have been current in which the family living under the headship of a father is accepted as the ultimate social unit. These theories have taken various shapes . . . with Sir Henry Maine (*Ancient Law*, 1861) the theory becomes a theory of the origin of society, or at least of the earliest stage of society in which Comparative Jurisprudence is called upon to take interest."[1]

Morgan was undoubtedly the greatest sociologist of the past century, and in his monumental work (1871) laid a solid foundation for the study of the family and kinship systems; he formulated a scheme of the evolution of the family based on a study of the classificatory system of relationships,[2] of which he was the discoverer. According to this scheme, human society has advanced, through gradual evolution, from a state of complete promiscuity to one characterised by monogamy. Dr. Rivers[3] points out that "In recent years the scheme has encountered

[1] D. McLennan, *The Patriarchal Theory*, 1885, p. x.

[2] In the classificatory system most of the kin in the same generation are grouped under one general term; *e.g.*, all the males of the grandfather's generation are called by one term, another term includes father, father's brothers, father's male cousins, mother's sisters' husbands, mother's female cousins' husbands, and so on.

[3] W. H. R. Rivers, "On the Origin of the Classificatory System of Relationships," *Anthropological Essays* (Tylor Volume), 1907.

much opposition. . . . The opponents of Morgan have made no attempt to distinguish between different parts of his scheme, but, having shown that certain of its features are unsatisfactory, they have condemned the whole." The greater part of Morgan's work is, however, of lasting value. Morgan based his conclusions on an enormous number of kinship terms collected by himself and others from every available source. Dr. Rivers has introduced[1] a new method of collecting similar data by means of recording exhaustive genealogies from a limited area. In this way not only can kinship terms be collected with accuracy, but a large number of other sociological data are obtained with a readiness and precision not hitherto possible. Indeed, it is no exaggeration to say that this method is producing a revolution in the method of sociological field work.

In a later book (1878) Morgan summarised his earlier conclusions and proposed a classification of culture consisting of a lower, middle, and an upper Status of Savagery, a lower, middle, and an upper Status of Barbarism, and the Status of Civilisation based upon certain inventions and industries.

About this time various students wrote on marriage and the family, of whom the foremost

[1] *Jour. Anth. Inst.*, xxx., 1900, p. 74; *Sociological Rev.*, 1910.

were Giraud-Teulon (1867, 1874, 1884), H. Post (1875), Letourneau (1888), Von Hellwald (1889), and others, the conclusions of the earlier writers being summed up by Professor E. Westermarck in his masterly *History of Human Marriage* (1891); but much has been written since that date on this subject of perennial interest.

Professor F. H. Giddings, in his *Principles of Sociology*, sums up in the following words the trend of modern writers on ethnological sociology:

> Professor Ludwig Gumplowicz [1883] has tried to demonstrate that the true elementary social phenomena are the conflicts, amalgamations, and assimilations of heterogeneous ethnical groups. M. Novicow [1893], generalising further, argues that social evolution is essentially a progressive modification of conflict by alliance, in the course of which conflict itself is transformed from a physical into an intellectual struggle. Professor De Greef [1886], looking at the question in a very different way, finds the distinctive social fact in contract, and measures social progress according to the displacement of coercive authority by conscious argument. Mr. Gabriel Tarde [1890], in an original and fascinating study, which has made an enduring impress on both psychological and sociological thought, argues that the primordial social fact is imitation, a phenomenon antecedent to all mutual aid, division of labour and contract. Professor Émile

> Durkheim [1895], dissenting from the conclusions of M. Tarde, undertakes to prove that the characteristically social process, and therefore the ultimate social phenomenon, is a coercion of every individual mind by modes of action, thought, and feeling that are external to itself (p. 14).

According to Giddings, the original and elementary subjective fact in society is "the consciousness of kind."

Social psychology offers a vast and fertile field which has been but little worked, and there was needed an introduction to the subject which should afford that general point of view which is the starting-point of further studies. This Dr. W. McDougall has attempted in a recently published little book.[1] His general conclusion is that the life of societies is not merely the sum of the activities of individuals moved by enlightened self-interest, or by intelligent desire for pleasure and aversion from pain; but that the springs of all the complex activities that make up the life of societies must be sought in the instincts and in the other primary tendencies that are common to all men and are deeply rooted in the remote ancestry of the race. Professor E. A. Ross, of Wisconsin, simultaneously attacked the same subject, on the

[1] *An Introduction to Social Psychology*, 1908.

problems of which he had previously written.[1]

**Magic and Religion.**

Magic and religion are very generally held to be not only distinct from one another, but antithetical. There is, however, a tendency among certain living students to regard them as analogous phenomena, both being expressions of a belief in a power or energy which may be designated by the Melanesian term "mana," or the American "orenda." It has more than once been pointed out that it is in some cases very hard—perhaps impossible—to determine whether certain actions can be classed as either magical or religious, as they appear to belong to both categories. As in the case of religion from the ethnological standpoint, magic has been investigated in the field, and immediate references to it are to be found in ethnological literature—the comparative study of magic has to some extent been undertaken by Frazer, Jevons, and others; but one of the most important contributions to the subject is by Hubert and Mauss,[2] who treat it from a sociological aspect.

[1] *Congress of Arts and Sci., St. Louis*, 1904, v. (1906) p. 869.

[2] H. Hubert et M. Mauss, "Esquisse d'une théorie générale de la magie," *L'Année sociologique*, vii., 1904. M. Mauss, "L'Origine des pouvoirs magiques dans les sociétés Australiennes," *École pratique des Haute Études* (Sec. Relig.), 1904.

Parson Thwackum in *Tom Jones* says: "When I mention religion I mean the Christian religion; and not only the Christian religion, but the Protestant religion; and not only the Protestant religion, but the Church of England." Anthropology, by a reverse process, passes "in larger sympathy from specific creeds to partake of the universal spirit which every creed tries to embody."[1] The interest of anthropology in religion was defined by Huxley.[2] "Anthropology has nothing to do with the truth or falsehood of religion—it holds itself absolutely and entirely aloof from such questions—but the natural history of religion, and the origin and growth of the religions entertained by the different tribes of the human race, are within its proper and legitimate province."

**Anthropology and Religion.**

This is not the place to attempt a definition of religion—a task which has led to so many failures. We must be content with the statement that it most frequently presents itself under the aspects of ritual, myth, and belief. Anthropology has hitherto practically confined its attention to ritual and myth, and but too frequently exclusively to the last.

As Andrew Lang (1887)[3] points out, in the

[1] Clodd, *Animism*, 1905, p. 11.

[2] Address to Dept. of Anthrop., Brit. Ass., Dublin, 1878.

[3] 1899 ed., pp. 6, 7.

sixth century B.C., Xenophanes complained that the gods were credited with the worst crimes, and other classical writers were shocked at the contradictions between the conception and ritual worship of the same god. In ancient Egypt the priests strove to shift the burden of absurdity and sacrilege from their own deities. It taxed the ingenuity of pious Brahmans to explain the myths which made Indra the slayer of a Brahman. Euhemerus (316 B.C.), in his philosophical romance, *Sacra Historica*, in rationalising the fables about the gods was regarded as an atheist. Certain writers like Plutarch (60 A.D.) and Porphyry (270 A.D.) made the ancient deities types of their own favourite doctrines, whatever these might happen to be. The early Christians had a good case against the heathen. Eusebius, in the *Præparatio Evangelica*, anticipating Andrew Lang himself, "ridiculed, with a good deal of humour, the old theories which resolved so many mythical heroes into the sun" (p. 20). "The physical interpreters," said Eusebius, "do not even agree in their physical interpretations." The light of the anthropological method had dawned on Eusebius. Many centuries later Spencer, Master of Corpus Christi College, Cambridge (1630–93), had no other scheme in his mind in his erudite work on Hebrew ritual,[1] which he considered was but an expurgated

[1] *De Legibus Hebræorum Ritualibus*, 1732.

adaptation of heathen customs. Fontenelle[1] explained the irrational element in myth as inherited from savagery.

The revival of learning made scholars acquainted with the religions not only of Greece and Rome, but of the nations with whom the Greeks and Romans had come in contact—Egyptians, Semites, Persians, and Indians. Travellers gave accounts of the religions they found in the remote parts of the world, and missionaries reported on beliefs and customs of many nations. These were the sources from which were compiled the comprehensive works on religion, from Alexander Ross, *View of All the Religions in the World*, etc., 1652, to Dupuis, *Origine de tous les cultes ou Religion universelle*, 1794. All heathen religions were believed to be based on sun and star worship.

New vistas were opened up by the writings of De Brosses (1760), who investigated the beliefs of savage races and based all religion on "Fetishism."

To quote once more from Lang:

> In the beginning of the [nineteenth] century Germany turned her attention to mythology. In a pious kind of spirit, Friedrich Creuzer [1771–1858] sought to find symbols of some pure, early, and Oriental theosophy

[1] *De l'Origine des Fables : Œuvres*, vol. iii., 1758.

> in the myths and mysteries of Greece. The great Lobeck, in his *Aglaophamus* (1829), brought back common-sense, and made it the guide of his vast, his unequalled learning. In a gentler and more genial spirit, C. Ottfried Müller [1797–1840] laid the foundation of a truly scientific and historical mythology. Neither of these writers had, like Alfred Maury [1857], much knowledge of the myths and faiths of the lower races, but they often seem on the point of anticipating the ethnological method. (*L.c.*, p. 23.)

**Folklore.**

The mythological aspect of the subject was illuminated by the researches of the brothers Grimm (J. L. K., 1785–1863; W. K., 1786–1859), whose collections of *Märchen* (1812–15) were found to contain Teutonic myths, and by their resemblance to Norse, Greek, and Vedic mythology suggested that in German folklore were remains of a common Indo-Germanic tradition. This was the beginning of the intelligent study of folklore. Mannhardt (1865) and others investigated popular, and especially peasant, customs and beliefs connected with agriculture and vegetation; and showed that here, in what Christianity had reduced to superstition, were to be found survivals of the religions that Christianity had supplanted. Thenceforward the study of folklore, and of the "lower mythology" of beliefs, customs, and superstitions,

gradually developed into a science, which is now recognised as the valuable ally of anthropology. Meanwhile the anthropological signification of religion was emerging from the mass of materials collected from all over the globe. Anthropology established its universality, and made many attempts to find a common factor, first in Astral worship, then in Euhemerism (Banier, 1738), Fetishism (De Brosses, 1709–1777), Nature-worship (Max Müller, etc.), Ancestor-worship (Herbert Spencer, Lippert [1866], etc.), and later in Totemism. These hypotheses were based on the erroneous assumption that savage religion represented the primitive mode of thought, out of which civilised religions had evolved. Later it was realised that

> The Australian black or the Andaman Islander is separated by as many generations from the beginning of religion as his most advanced contemporaries; and in these tens or hundreds of thousands of years there has been constant change, growth, and decay—and decay is not a simple return to the primal state. We can learn a great deal from the lowest existing religions, but they cannot tell us what the beginning of religion was, any more than the history of language can tell us what was the first human speech.[1]

[1] G. F. Moore, "The Hist. of Religions in the Nineteenth Cent.," *Congress Arts and Sci., St. Louis*, 1904, p. 440.

The study of comparative religion, though not originated by Max Müller (1823–1900), owed much to his energy. His lectures on Comparative Mythology (1856) were followed by lectures on the Science of Religion (1870), and on the religions of the world (1873). He inaugurated the annual series of the Hibbert Lectures with a study of the origin and growth of religion, as illustrated by the religions of India; and as Gifford lecturer at Glasgow (1888–1892), discussed Natural Religion, Physical Religion, Anthropological Religion, and Theosophy or Psychological Religion. His *Contributions to the Science of Mythology* appeared in 1897. His method of investigation was almost entirely linguistic, based on phonetic laws which later research has discredited; and his theory of "mythology as the disease of language" is no longer tenable.

**Comparative Religion.**

The charm of the writings of Max Müller, and the interest which they awakened in Vedic studies, gave a new impulse to the study of the history of religions. The hymns of the Rig-Veda are by no means the product of a simple society, as he supposed; in his view hymns and myths were dissociated from ritual religion, and gods were identified with natural objects. The death-blow to this method of studying religion in our country was given by the keen criticism

of Andrew Lang (1884, 1887). The too-narrow basis of Max Müller's theories was overthrown by arguments derived from comparative ethnology; "the silly, senseless, and savage element" (as he termed it) in classical mythology proved to be the stumbling-block over which he fell.

A firmer foundation for the study was laid by Tylor and Lubbock. Though Max Müller originated the name Science of Religion, it was Tylor who first introduced into it a scientific method, and so laid the foundations for future investigation.

Later workers in the field fall naturally into two groups. Some make intensive studies of particular forms of religion, either historical, such as Robertson Smith (1846–1894), or living, such as Codrington in Melanesia, J. O. Dorsey [1] in America, Spencer and Gillen in Australia, and many others.

Other workers attempt, by correlating the mass of material, to discover the fundamental religious conceptions of man, and to trace their subsequent development. Among these may be noted Grant Allen, Crawley, Frazer, Hartland, Jevons, Andrew Lang, Marett, and many others.

To those who are acquainted with the modern

[1] "Omaha Sociology," *Ann. Rep. Bur. Am. Ethn. Rep.* ii., 1884; "Siouan Sociology," xv., 1897.

study of comparative religion in this country it is unnecessary to point out the influence of such workers as Mannhardt, Tylor, and Robertson Smith on subsequent writers; nor is it needful to draw attention to the vast erudition and eloquent writing of Professor J. G. Frazer, whose monumental work on *The Golden Bough* has become a classic, or to the memorable *Legend of Perseus* by E. S. Hartland.

The study of the myths of various peoples is receiving the attention of numerous students, and in Germany certain ethnologists, such as Ehrenreich, Foy,[1] and Frobenius,[2] find sun and moon gods in the most unlikely places. There is, however, considerable danger that this nature-mythology is being carried too far.

The origin of the moral idea has also been discussed from the ethnological point of view, as Hobhouse (1906) and Westermarck (1906) have exemplified in their great books.

Magic, religion, and morality have, as we have seen, especially of late years, been regarded almost entirely from the anthropological standpoint. But a new school of French students has arisen who maintain that these are essentially social phenomena. The writings of Durkheim,

[1] *Archiv für Religionswissenschaft*, x., 1907, etc.

[2] "Die Weltanschauung der Naturvölker," *Beitr. z. Volks-und Völkerkunde*, vi., 1898; *Das Zeitalter des Sonnengottes*, i., 1904; *The Childhood of Man*, 1909.

Hubert, and Mauss[1] have initiated a new method of study which promises to have far-reaching results.

[1] The work of this school is mainly to be found in *L'Année sociologique* (1898).

# CHAPTER XI

## Linguistics

LINGUISTICS as a department of anthropology may be regarded from many points of view. To the evolutionist language forms one of the tests dividing the Hominidæ from the other anthropoids; the somatologist is interested in correlating the phonetic system with the structure of the organs connected with the mechanism of speech; and the ethnologist studies language for the evidence it affords of ethnic affinity or social contact, or as a means of determining the grade of culture to which a particular people has attained, or, again, as a reflection of their character or psychology. The linguistic classifications of Gallatin, Humboldt, and Müller are referred to later.

**The Aryan Controversy.**

The connection between linguistics and anthropology assumed its greatest importance in the middle of the nineteenth century, when the discoveries and theories of philologists were adopted wholesale to explain the problems of

European ethnology, and the Aryan controversy became the *locus* of disturbance throughout the Continent. "No other scientific question, with the exception, perhaps, of the doctrine of evolution, was ever so bitterly discussed or so infernally confounded at the hands of Chauvinistic or otherwise biassed writers."[1]

In 1786 Sir William Jones had pointed out the relationship between Sanskrit, Greek, Latin, German, and Celtic, and suggested a common parentage, which was confirmed by Bopp in 1835. Unfortunately, a primitive unity of speech was held to imply a primitive unity of race.

Among the ethnological papers read at the meeting of the British Association in 1847 was one "On the Results of the Recent Egyptian Researches in Reference to Asiatic and African Ethnology, and the Classification of Languages," in which Baron Bunsen sought to show that the whole of mankind could be classified according to language. In fact, it was taken for granted in 1847 that the study of comparative philology would be in future the only safe foundation for the study of anthropology.[2] The spread of this fallacy is usually attributed to Max Müller, whose charm of style and high reputation as a Sanskrit scholar did much to

[1] Ripley, 1899, p. 453.

[2] *Rep. Brit. Assoc.* (Cardiff), 1891, p. 787.

popularise the new science of philology. He invented the term "Aryan," which in itself contains two erroneous assumptions—one linguistic, that the Indo-Iranian group of languages is older than its relatives; and the other geographical, that its "cradle" was in ancient Ariana, in Central Asia. Moreover, in his lectures he spoke not only of an Aryan language, but of an "Aryan race." He is credited with having made "heroic reparation" for these errors when he wrote later: "To me an ethnologist who speaks of an Aryan race, Aryan blood, Aryan eyes and hair, is as great a sinner as a linguist who speaks of a dolichocephalic dictionary or a brachycephalic grammar. It is worse than a Babylonian confusion of tongues—it is downright theft." But, as he pointed out,[1] he himself never shared the misconception that he was accused of launching on the world. He admits that he was not entirely without blame, as he allowed himself occasionally the freedom to speak of the Aryan or the Semitic race, meaning the people who spoke Aryan or Semitic languages; but as early as 1853 he had protested against the intrusion of linguistics into ethnology, and

> called, if not for a complete divorce, at least for a judicial separation between the study of Philology and the study of Ethnology. . . . The phonologist should collect his evidence,

[1] *Rep. Brit. Assoc.* (Cardiff), 1891, p. 787.

> arrange his classes, divide and combine as if no Blumenbach had ever looked at skulls, as if no Camper had ever measured facial angles, as if no Owen had ever examined the base of a cranium. His evidence is the evidence of language, and nothing else; this he must follow, even though in the teeth of history, physical or political. . . . There ought to be no compromise between ethnological and phonological science. It is only by stating the glaring contradictions between the two that truth can be elicited.[1]

The protest was in vain. The belief in an "Aryan race" became an accepted fact both in linguistics and in ethnology, and its influence vitiates the work of many anthropologists even at the present day.

Naturally the question of the identity of the Aryan race was soon a subject of keen debate. The French and German schools at once assumed opposite sides, the Germans claiming that the Aryans were tall, fair, and long-headed, the ancestors of the modern Teutons; and the French, mainly on cultural evidence, claiming that the language, together with civilisation, came into Europe with the Alpine race, which forms such a large element in the modern French population.

There are two ways in which linguistics may

[1] *Rep. Brit. Assoc.* (Cardiff), 1891, p. 787.

be studied as an aid to anthropology—first, with regard to structural analysis, by which linguistic affinities may be proved; secondly, by what has been called "linguistic palæontology," or the study of root words, by means of which the original culture of a people may be ascertained. Philology pushed both these methods too far. It claimed the right, by proof of structural analysis, to link up the racial relationships of the European and Asiatic peoples, and, by linguistic palæontology, to determine the culture of the original "Aryans," and to identify their original home. It was over the question of the "Aryan cradle" that they were forced to relinquish their too ambitious claims.

At the beginning of the nineteenth century it was generally believed that our first ancestors were created in 4004 B.C. and spoke Hebrew, and that the origin of the European languages dated from the migration of Japhet from the plains of Shinar, *cir.* 2247. The Asiatic origin of race and language was for long unchallenged. But in 1839 Omalius d'Halloy, followed by Latham in 1851, began to cast doubts on the Asiatic "cradle," noting that the Asiatic languages had no real claim to be considered older than those of Europe, and that in many ways the Lithuanian and Armenian were the most archaic in the family. More important still was the work of

Benfey,[1] who may be regarded as the originator of linguistic palæontology, and who used its evidence to shift the original dispersal from Asia to Europe. Various philologists followed, employing different methods to prove different theories; and the Aryan cradle was located in many parts of Europe and Asia, ranging from the Pamir plateau to the Baltic plains. Max Müller confessed in 1888 that "the evidence is so pliant that it is possible to make out a more or less plausible case" for almost any part of the world.

**Language and Race.**

From claiming too much the swing of the pendulum brought linguistics into disrepute with ethnologists, and for a time the evidence of language was looked upon with suspicion. Even philologists were accused of going too far in this direction.

Professor Sayce[2] says: "Identity or relationship of language can prove nothing more than social contact. . . . Language is an aid to the historian, not to the ethnologist." But as Professor Keane points out, there are many cases in which language infallibly proves the existence of ethnic elements which would otherwise have been unsuspected—as, for example,

[1] T. Benfey, in preface to Fick's *Vergleichendes Wörterbuch der Indogermanischen Sprachen*, 1868.

[2] *Science of Language*, ii., p. 317.

in the case of the Basques of Europe. "Language used with judgment is thus seen to be a great aid to the ethnologist in determining racial affinities, and in solving many anthropological difficulties" (1896, p. 205).

Although Max Müller wrote nearly twenty years ago, "I believe the time will come when no anthropologist will venture to write on anything concerning the inner life of man without having himself acquired a knowledge of the language in which that inner life finds its truest expression," we are obliged still to echo his lament: "How few of the books in which we trust with regard to the characteristics or peculiarities of savage races have been written by men . . . who have learnt their languages until they could speak them as well as the natives themselves!"[1]

[1] *Rep. Brit. Assoc.* (Cardiff), 1891, p. 792.

## CHAPTER XII

### Cultural Classification and the Influence of Environment

WE have seen that in its beginning the science of man was little more than a branch of zoölogy, and that his structural characters were the first to attract attention and to form the material of study; hence all the earlier classifications were based on physical features. Gallatin was one of the first to classify mankind rather by what they *do* than by what they *are*.

**Gallatin.**

Albert Gallatin (1761–1849) was born at Geneva, emigrated to America before he was twenty, and rose rapidly to the position of one of the foremost of American statesmen, becoming United States Minister to France, and later to England. He noted the unsatisfactoriness of groupings by colour, stature, head-form, etc., in the case of the races of America, and made a preliminary classification of the native tribes on the basis of language. Major J. W. Powell (1834–1902) and

Dr. Brinton (1837–1899) elaborated the linguistic classification of the American Indians.

Classification by language had already been utilised by Wilhelm von Humboldt (1767–1835) in the introduction to his great work on the Kawi language of Java, entitled *Ueber die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwickelung des Menschengeschlechts*, which was published posthumously, 1836–40. The rise of the new science of philology gave a fresh impetus to this method of classification, which was adopted by F. Müller (1834–1898), and utilised recently by Deniker and various other writers.

**Wilhelm von Humboldt.**

Other classifications, by means of cultural distinctions, have been attempted. Among these may be noted that based on mythology and religion of Max Müller, on institutions and social organisation of Morgan and Ratzel, or on musical systems of Fétis.

Hippocrates (*c.* 460–377), in his work *About Air, Water, and Places*, first discusses the influence of environment on man, physical, moral, and pathological. He divided mankind into groups, impressed with homogeneous characters by homogeneous surroundings, demonstrating that mountains, plains, damp, aridity, and so on, produced definite and varying types.

**Hippocrates.**

**Bodin.**

Bodin, writing in 1577 *Of the Lawes and Customes of a Common Wealth* (English edition, 1605), contains, as Professor J. L. Myres has pointed out,[1] "the whole pith and kernel of modern anthropogeography. . . . His climatic contrasts are based on the Ptolemaic geography . . . and he argues as if the world broke off short at Sahara. . . . On his classification of environments from arctic North to tropic South" he superposes "a cross-division by grades of culture from civil East to barbaric West."

**Buffon.**

Buffon followed Hippocrates. Man, said Buffon, consists of a single species. Individual variations are due to three causes —climate, food, and habits. These influences, acting over large areas on large groups of people, produce general and constant varieties. To these varieties he gave the name of *race*. This doctrine was the main support of the monogenists.

**Alexander von Humboldt, Ritter, and Waitz.**

The year 1859 marks a crisis in this field of research, as in so many others. Alexander von Humboldt (1769–1859), the Prussian naturalist and traveller, spent the latter part of his life in writing his classic *Kosmos*, a summary and exposition of the laws and conditions of the physical uni-

[1] *Rep. Brit. Assoc.*, 1909 (1910), p. 593.

verse. Karl Ritter (1779–1859), Professor of Geography at the University of Berlin, published, between 1822 and his death, the ten volumes of *Die Erdkunde im Verhältniss zur Natur und zur Geschichte des Menschen*. These works formed the basis from which was developed the German view of geography as a science of the co-relation of distribution. In 1859 Waitz, in his *Anthropologie der Naturvölker*, insisted on the interrelation between the physical organisation and the psychic life of mankind.

**Buckle.**

Between 1857 and 1861 appeared Buckle's *History of Civilisation*, in which the influence of environment on mankind is strongly emphasised. "To one of these four classes (Climate, Food, Soil, and the General Aspect of Nature) may be referred all the external phenomena by which Man has been permanently affected."[1] The recognition of the environmental influence has long been a characteristic of the French school. Ripley (1900, p. 4) points out that, wherever the choice lies between heredity and environment, the French almost always prefer the latter as the explanation of the phenomenon. This is seen from the time of Bodin (1530–1596) and Montesquieu (1689–1755), with their objective explanations of philosophy, and Cuvier, who traced the close relationship between philosophy

[1] *L. c.*, chap. ii.

and geological formation, to Turquan (1896), who mapped out the awards made by the Paris Salon, showing the coincidence of the birthplace of the artists with the fertile river basins.

In Germany the exponents of these theories were Cotta and Kohl, and later Peschel, Kirchhoff, Bastian, and Gerland; but the greatest name of all is that of Friedrich Ratzel (1844–1904), who has written the standard work on *Anthropo-Geographie* (1882–91). Another monumental work is that by Élisée Reclus (1820–1905), *Nouvelle Géographie Universelle* (1879–1894).

**Ratzel.**

**Reclus.**

A great stimulus to the development of ethnological sociology was given by the school of Le Play in France, the concrete application of whose theories was worked out by Demolins and others, and published in *La Science Sociale* and separate works. It is the essential procedure of the followers of this school, in their studies in descriptive sociology, to begin with the environment, and to trace its effects upon the occupation of the people, their sociology, and so forth. The method is an extremely suggestive one and has led to many brilliant generalisations. The danger consists in theorising from imperfect data, and there is a tendency to attribute certain social conditions directly to the influences of environment

**Le Play.**

and occupation, where a wider knowledge of ethnology would show that these or analogous social conditions obtained in other places where they were not produced by the causes suggested.

## RETROSPECT

ON taking a brief final survey of the history of anthropology, one is struck by the fact that, owing to the tendency of students to limit their attention to one of the varied subjects which are grouped under the term Anthropology, the progress of the science has been very irregular.

Physical anthropology has had very numerous devotees who have approached the subject mainly from the point of view of small anatomical variations; but even at the present day the significance of many of the details is not understood, and very little advance has been made concerning the criteria of racial anatomy. We have yet to discover how adequately to describe or gauge the essential anatomical distinctions between races and peoples. This problem is complicated by our ignorance of the stability of physical characters, and of how far or how speedily they are affected by change of environment. At the present time the effects of miscegenation and of environment afford fruitful fields for research. The imperfection of the geological record is answerable for the

relatively slow progress that has been made in tracing the evolution of man as an animal.

Whereas the structural characters of man have been studied by trained scientific men, the history of man from a cultural point of view has mainly been investigated by literary men, who have approached the subject from various sides, and, from lack of experience in the field or by virtue of their natural reliance upon documentary evidence, have often not been sufficiently critical regarding their authorities. The comparative method has yielded most valuable results, but it is liable to lead the unwary into mistakes. To employ biological terms, analogy is apt to be mistaken for homology, since customs or beliefs (which, it must be remembered, are in the vast majority of cases extremely imperfectly recorded) may have a superficial resemblance. If all the facts were known, they might be found to have had a very different origin or significance. Comparisons made within a given area or among cognate peoples have a greater value than those drawn from various parts of the world. What is most needed at the present day is intensive study of limited areas; the studies already so made have proved most fruitful. Although we know a good deal about many forms of social organisation, we find that in very few cases is the knowledge sufficiently precise to explain them, owing to

the fact that the data were not collected by adequately trained observers. In other words, cultural anthropology has been too much at the mercy of students who have not received a sufficiently rigorous training.

The objects made by man have only recently been subjected to critical study. In this the archæologists have been in advance of the ethnologists. The distribution of objects and its significance have been studied more in Germany than elsewhere, and already afford promising results.

Anthropology is slowly becoming a coherent and organised science. The chief danger to which it is liable is that its fascination and popularity, touching as it does every department of human thought and activity, tend to premature generalisations.

The history of anthropology, like that of most other sciences, is full of examples of opposition from the prejudice and bigotry of those who place more reliance on tradition than on the results of investigations and the logical deductions therefrom; but the reactionaries have always had to give way in the end.

## BIBLIOGRAPHY


Allen, Grant. *The Evolution of the Idea of God.* 1897.

Bachofen, J. J. *Das Mutterrecht.* 1861.

Bastian, P. W. A. *Der Mensch in der Geschichte.* 1860.

Beddoe, J. *The Races of Britain.* 1885.—*The Anthropological History of Europe.* 1893.—For numerous references see Ripley's *Bibliography.*

Bendyshe, T. "The History of Anthropology." *Memoirs of Anthropological Society.* I., 1865.

Brosses, de. *Du culte des dieux fétiches, ou parallèle de l'ancienne religion de l'Égypte avec la religion actuelle de Nigritie.* 1760.

Camper, P. *Dissertation physique de M. Pierre Camper sur les Différences réeles que présentent les traits de Visage chez les Hommes de différents pays et de différents Âges.* 1791.

Clodd, E. *Tom Tit Tot.* 1898.—*Animism, the Seed of Religion.* 1905.

Darwin, C. *Origin of Species.* 1859.—*Descent of Man.* 1871.—*Expression of the Emotions in Man and Animals.* 1872.

Davis, Barnard, and Thurman, J. *Crania Britannica*. 1865.

Dieserud, J. *The Scope and Content of the Science of Anthropology*. 1908.

Durkheim, E. *De la division du travail social*. 1893.—*Les règles de la méthode sociologique*. 1895.

Evans, J. *The Ancient Stone Implements, Weapons, and Ornaments of Great Britain*. 1872.—*The Ancient Bronze Implements*, etc. 1881.

Frazer, J. G. *Totemism*. 1887.—*Totemism and Exogamy*. 1910.

Gallatin, A. *Synopsis of the Indian Tribes*. 1836.—*Notes on the Semi-Civilised Nations of Mexico, Yucatan, etc.* 1845.

Giddings, F. H. *The Principles of Sociology*. 1896.

Gomme, A. B. *The Traditional Games of England*, etc. 1894–8.

Gomme, G. L. *Ethnology in Folklore*. 1892. —*Folklore as a Historical Science*. 1908.

Haddon, A. C. *The Decorative Art of British New Guinea*. 1894.—*Evolution in Art*. 1895.—*The Study of Man*. 1898.—*Magic and Fetishism*. 1906.—*Races of Man and their Distribution*. 1909.

Hartland, E. S. *Primitive Paternity*. 1910.

Hobhouse, L. T. *Morals in Evolution*. 1906.

Jevons, F. B. *Introduction to the History of Religion.* 1896.

Lafitau, J. F. *Mœurs des Sauvages comparées aux Mœurs des premiers Temps.* 1723.—*Hist. des Découvertes et des conquêtes des Portugais dans le Nouveau Monde.* 1733.

Lang, A. *Custom and Myth.* 1884.—*Myth, Ritual, and Religion.* 1887.—*The Making of Religion.* 1898.—*Magic and Religion.* 1901.

Lartet, É., et Christy, H. *Reliquiæ Aquitanicæ.* 1865–75.

Latham, R. G. *The Natural History of the Varieties of Man.* 1850.—Preface to the *Germania* of Tacitus. 1851.—*Descriptive Ethnology.* 1859.

MacRitchie, D. *The Testimony of Tradition.* 1890.—*Fians, Fairies, and Picts.* 1893.

Mannhardt, W. *Roggenwolf und Roggenhund.* 1865.—*Die Korndämonen.* 1868.—*Der Baumkultus der Germanen.* 1875.—*Antike Wald-und Feldkulte.* 1877.—*Mythologische Forschungen.* 1884.

Marett, R. R. *The Threshold of Religion.* 1909.

Mason, Otis T. *The Origins of Invention.* 1895.—*Woman's Share in Primitive Culture.* 1895.

Morgan, L. H. *Systems of Consanguinity,* etc.: *Smithsonian Contributions to Knowledge,* 218. 1871.—*Ancient Society.* 1878.

Mortillet, G. de. *Le Préhistorique Antiquité de l'homme.* 1883.

Myres, J. L. *Herodotus and Anthropology* (in *Anthropology and the Classics*). 1908.

Nott, J. C., and Gliddon, G. R. *Types of Mankind.* 1853.—*Indigenous Races of the Earth.* 1857.

Pitt-Rivers, A. Lane-Fox. Catalogue of the Anthropological Collection, etc., Bethnal Green Museum. 1874.—*The Evolution of Culture, and other Essays* (Reprint of papers published from 1868–75). 1906.

Quatrefages de Bréau, A. de. For references see Ripley's *Bibliography* and *L'Anth.*, III., p. 14. 1892.

Ratzel, F. *Anthropo-Geographie.* 1882–91. —*Völkerkunde.* 1887–8 (translated into English as *The History of Man;* 1896).—*Die Erde und das Leban.* 1901.

Ripley, W. Z. *The Races of Europe* (with a voluminous bibliography). 1900.

Smith, W. Robertson. *Kinship and Marriage in Early Arabia.* 1885.—*The Religion of the Semites.* 1889.

Stolpe, H. *Utvecklingsföreteelser i Naturfolkens Ornamentik. Ymer.* 1890. (Translated in *Trans. Rochdale Lit. and Scie. Soc.;* 1892.)—*Studier i Amerikansk Ornamentik.* 1896.

Villermé, L. R. "Sur la Population de la Grande-Bretagne," etc. *Ann. d'hygiène,* pub.

xii., p. 217. 1834.—See also xiii., p. 344 (1835); xxx., p. 28 (1843).

Virchow, R. L. K. See Ripley's *Bibliography*, pp. 118–21.

Wallace, A. R. *Darwinism*. 1889.

White, C. *An Account of the Regular Gradation in Man, etc.* 1799.

Wilde, W. R. *A Descriptive Catalogue of the Antiquities in the Museum of the Royal Irish Academy*. 1863.

Windle, B. C. A. *Essay Concerning the Pigmies of the Ancients*. 1894.

# INDEX OF AUTHORS


PAGE

Agassiz, L. ... 110
Allen, Grant ... 176
Aristotle ... 1, 11, 58
Avebury, Lord ... 161, 176

Bachofen, J. J. ... 163
Balfour, H. ... 156
Barclay ... 34
Bastian, A. ... 100, 102, 190
Beard ... 147
Beddoe, J. ... 49
Bernier, F ... 106 *ff.*
Bertillon, A. ... 56
Bertrand, A. J. L. ... 150
Blower ... 111
Blumenbach, J. F. ... 25, 28 *ff.*, 109, 130
Boas, F ... 82
Bodin, J. ... 134, 188 *ff.*
Bonstetten, G. ... 150
Bory de Saint-Vincent ... 61, 110 *ff.*
Boucher de Perthes, J. ... 148 *ff.*
Bourgeois, Abbé ... 151 *ff.*
Boyd Dawkins, W. ... 140, 151
Breuil, H. ... 150
Brinton, D. G ... 187
Broca, P. P. ... 38 *ff.*, 61, 86, 113
Brosses, C. de ... 172 *ff.*
Buckland, W ... 141 *ff.*
Buckle, H. T. ... 162 *ff.*, 189
Buffon, G. L. L., Comte de ... 17, 18 *ff.*, 62, 138, 188

Camper, P. ... 31 *ff.*
Capellini ... 153
Capitan, Dr ... 150
Cartailhac, E. ... 150

PAGE

Chambers, R ..... 69 *ff.*
Chantre, E ..... 150
Christol, Tournal de ..... 143
Christy, H ..... 150
Comte, A ..... 162
Crawley, E ..... 176
Cunningham, D. J ..... 75
Cuvier, Baron G. L. C. F .... 61, 67 *ff.*, 84, 110, 116, 189

Darwin, C ..... 74 *ff.*, 117
Daubenton ..... 34
Davis, J. Barnard ..... 151
Demolins, E ..... 190
Deniker, J ..... 113 *ff.*, 131, 187
Dennett, R. E ..... 99
Desmoulins, A ..... 110 *ff.*, 130
Doornik, J. E ..... 35
Dorsey, J. O ..... 176
Draper, J. W ..... 162
Dubois, E ..... 92 *ff.*
Duckworth, W. L. H ..... 93, 118
Dupont, E ..... 143
Dupuis, C. F ..... 172
Durkheim, É ..... 168, 177

Ecker, J. A ..... 151
Edwards, W. F ..... 120
Ehrenreich, P ..... 177
Evans, J ..... 138, 149 *ff.*

Fechner, G. T ..... 103
Flower, W ..... 113 *ff.*
Fontenelle, B. le B. de ..... 172
Fouillée, A ..... 102
Foy, W ..... 177
Frazer, J. G ..... 169, 176, 177
Frere, J ..... 138
Frobenius, L ..... 177
Fuhlrott, C ..... 85, 151

Gallatin, A ..... 186
Galton, F ..... 53 *ff.*, 103, 105
Gerland, G ..... 119, 190
Giddings, F. H ..... 4, 167
Gillen, F. J ..... 176

PAGE
Giraud-Teulon, A. ... 167
Gliddon, G. R. ... 61, 111, 131
Grattan, J. ... 35 *ff.*
Greef, G. de ... 167
Greenwell, Canon ... 151
Grimm, J. L. K. ... 173
Grimm, W. K. ... 173
Gumplowicz, L. ... 167
Guyot, A. H. ... 162

Haeckel, E. ... 110, 112, 117
Hamy, E. T. ... 42
Harrison, B. ... 153
Hartland, E. S. ... 176, 177
Hauser, O. ... 88
Haworth, S. ... 15
Hellwald, F. A. H. von ... 167
Herder, J. G. von ... 134
Herodotus ... 122, 132
Herschel, W. ... 56
Heusinger ... 111
Hippocrates ... 10, 187
Hobbes, T. ... 134
Hobhouse, L. T. ... 177
Hovelacque, A. A. ... 62
Howitt, A. W. ... 164
Hubert, H. ... 109, 178
Humboldt, A. von ... 124, 188
Humboldt, W. von ... 179, 187
Hundt, Magnus ... 1
Hunt, J. ... 61, 76 *ff.*, 79 *ff.*, 96
Huxley, T. H. ... 70 *ff.*, 86, 112, 116

Jevons, F. B. ... 163, 169, 176

Kames, Lord ... 60
Keane, A. H. ... 110, 115, 131
Keller, F. ... 146
Knox, R. ... 61, 130
Kölliker ... 111
Kollmann, J. ... 17

Lamarck, J. B. A. ... 66
Lang, A. ... 170, 172, 176 *ff.*
Lartet, E. ... 150

PAGE

Latham, R. G. ..... 130, 183
Lawrence, Sir W ..... 14, 63 *ff.*
Le Play ..... 190
Letourneau, C ..... 167
Lindenschmidt, L ..... 151
Linnæus, K ..... 18 *ff.*, 62, 107 *ff.*, 116
Lissauer, A ..... 151
Locke, J ..... 134
Lubbock, J ..... *See* Avebury
Lucretius ..... 122 *ff.*
Lyell, C ..... 143, 148 *ff.*

McDougall, W ..... 4, 104, 168
MacEnery, J ..... 143 *ff.*
McLennan, J. F ..... 163 *ff.*
MacRitchie, D ..... 17
Maine, H ..... 164, 165
Mannhardt, W ..... 173, 177
March, H. Colley ..... 157
Marett, R. R ..... 176
Mason, Otis T ..... 156
Mauss, M ..... 169, 178
Meigs, J. A ..... 34, 38
Mercati ..... 138
Monboddo, J. B ..... 65
Montelius, O ..... 151
Montesquieu, C. de S., Baron de ..... 134, 189
Morgan, L. H ..... 163 *ff.*, 187
Mortillet, G. de ..... 150, 152
Morton, S. G ..... 35
Müller, Friedrich ..... 112, 131, 187
Müller, F. Max ..... 174 *ff.*, 182 *ff.*, 187
Myers, C. S ..... 52, 104
Myres, J. L ..... 121 *ff.*, 132, 134

Nicolucci, G ..... 151
Noetling, F ..... 153
Norris, E ..... 115
Nott, J. C ..... 61, 111, 131
Novicow, M ..... 167
Nyerup, R ..... 140

Owen, R ..... 75, 148

PAGE
Pearson, K. ... 53, 105
Pengelly, W. ... 144, 147 *ff.*
Peschel, O. ... 131, 190
Peyrère, de la ... 60, 138
Peyrony, M. ... 88
Pickering, C. ... 131
Piette, E. ... 150
Pitt-Rivers, A. H. Lane-Fox ... 155 *ff.*
Post, H. ... 167
Powell, J. W. ... 186
Prichard, J. C. ... 61, 63, 115, 127 *ff.*
Pruner Bey, F. ... 111

Quatrefages, A. de ... 17, 38, 41, 50, 61
Quetelet, L. A. J. ... 53

Ratzel, F. ... 127, 131, 187, 190
Read, C. H. ... 157
Reclus, J. Elisée ... 127, 190
Retzius, Anders ... 35 *ff.*
Ribeiro, C. ... 153
Ridgeway, W. ... 133
Ripley, W. Z. ... 109
Ritter, K. ... 189
Rivers, W. H. R. ... 104, 165
Rivière, E. ... 150
Rolleston, G. ... 151
Ross, A. ... 172
Ross, E. A. ... 168

Saint-Hilaire, E. G. ... 68 *ff.*
Saint-Hilaire, I. G. ... 112
Schmerling, Dr. ... 143
Schoetensack, O. ... 88
Semper, G. ... 157
Sergi, G. ... 44
Serres, Marcel de ... 143
Smith, W. Robertson ... 176, 177
Sollas, W. J. ... 90, 93, 153
Spencer, B. ... 176
Spencer, H. ... 72 *ff.*, 102, 163
Sperling, J. ... 15
Stolpe, H. ... 157
Strabo ... 124

PAGE
Tarde, G. ..... 167
Thurnam, J. ..... 151
Topinard, P. ..... 38, 41, 113, 131
Tylor, E. B. ..... 120, 127, 159 *ff.*, 176 *ff.*
Tyson, E. ..... 15 *ff.*

Vesalius. ..... 12
Virchow, R. L. K. ..... 43, 50, 86, 151
Virey, J. J. ..... 61, 110
Vogt, C. ..... 77, 117

Waitz, F. T. ..... 111, 115, 130, 188 *ff.*
Westermarck, E. ..... 167, 177
White, C. ..... 48
Wilde, W. R. ..... 135, 145 *ff.*
Windle, B. C. A. ..... 18
Worsaæ, J. J. A. ..... 140
Wundt, W. ..... 103

*A Selection from the Catalogue of*

## G. P. PUTNAM'S SONS

Complete Catalogue sent on application

# A History of the Sciences

¶ Hitherto there have been few, if any, really popular works touching the historical growth of the various great branches of knowledge. The ordinary primer leaves unexploited the deep human interest which belongs to the sciences as contributing to progress and civilization, and calling into play the faculties of many of the finest minds. Something more attractive is wanted.

¶ The above need in literature has now been met. Each volume in *The History of Sciences* is written by an expert in the given subject, and by one who has studied the history as well as the conclusions of his own branch of science. The monographs deal briefly with the myths or fallacies which preceded the development of the given science, or include biographical data of the great discoverers. Consideration is given to the social and political conditions and to the attitudes of rulers

**G. P. Putnam's Sons**

**New York** **London**

# A History of the Sciences

and statesmen in furthering or in hindering the progress of the given science. The volumes record the important practical application of the given science to the arts and life of civilized mankind, and also contain a carefully-edited bibliography of the subject. Each volume contains from twelve to sixteen carefully-prepared illustrations, including portraits of celebrated discoverers, many from originals not hitherto reproduced, and explanatory views and diagrams. The series as planned should cover in outline the whole sphere of human knowledge.

¶ Science is to be viewed as a product of human endeavor and mental discipline, rather than taken in its purely objective reference to facts. The essential purpose has been to present as far as practicable the historical origins of important discoveries, also to indicate the practical utility of the sciences to human life.

**G. P. Putnam's Sons**

**New York** **London**

# A History of the Sciences

Each volume is adequately illustrated, attractively printed, and substantially bound.

*16mo. Each, net, 75 cents. By mail, 85 cents. 12 illustrations*

## History of Astronomy

### By George Forbes, M.A., F.R.S., M.Inst. C.E.

**Formerly Professor of Natural Philosophy, Anderson's College, Glasgow**

I thank you for the copy of Forbes's *History of Astonomy* received. I have run it over, and think it very good indeed. The plan seems excellent, and I would say the same of your general plan of a series of brief histories of the various branches of science. The time appears to be ripe for such a series, and if all the contributions are as good as Prof. Forbes's, the book will deserve a wide circulation, and will prove very useful to a large class of readers.—*Extract from a letter received from Garrett P. Serviss, B.S.*

## History of Chemistry

### By Sir Edward Thorpe, C.B., LL.D., F.R.S.

**Author of "Essays in Historical Chemistry," "Humphry Davy: Poet and Philosopher," "Joseph Priestley," etc.**

*12 illustrations. Two vols. Vol. I—circa 2000 B.C. to 1850 A.D. Vol. II—1850 A.D. to date*

The author traces the evolution of intellectual thought in the progress of chemical investigation, recognizing the various points of view of the different ages, giving due credit even to the ancients. It has been necessary to curtail many parts of the History, to lay before the reader in unlimited space enough about each age to illustrate its tone and spirit, the ideals of the workers, the gradual addition of new points of view and of new means of investigation.

## The History of Old Testament Criticism

### By Archibald Duff

**Professor of Hebrew and Old Testament Theology in the United College, Bradford**

The author sets forth the critical views of the Hebrews concerning their own literature, the early Christian treatment of the Old Testament, criticism by the Jewish rabbis, and criticism from Spinoza to Astruc, and from Astruc until the present.

**The History of Anthropology.**

By A. C. HADDON, M.A., Sc.D., F.R.S., Lecturer in Ethnology, Cambridge and London.

***In Preparation***

**The History of Geography.**

By Dr. JOHN SCOTT KELTIE, F.R.G.S., F.S.A., Hon. Mem. Geographical Societies of Paris, Berlin, Rome, Brussels, Amsterdam, Geneva, etc.

**The History of Geology.**

By HORACE B. WOODWARD, F.R.S., F.G.S., Assistant Director of Geological Survey of England and Wales.

**The History of New Testament Criticism.**

By F. C. CONYBEARE, M.A., late Fellow and Praelector of Univ. Coll., Oxford; Fellow of the British Academy; Doctor of Theology, *honoris causa*, of Giessen; Officer d'Academie.

***Further volumes are in plan on the following subjects:***

**Mathematics and Mechanics—Molecular Physics, Heat, Light, and Electricity—Human Physiology, Embryology, and Heredity—Acoustics, Harmonics, and the Physiology of Hearing, together with Optics, Chromatics, and Physiology of Seeing—Psychology, Analytic, Comparative, and Experimental—Sociology and Economics—Ethics—Comparative Philology—Criticism, Historical Research, and Legends—Comparative Mythology and the Science of Religions—The Criticism of Ecclesiastical Institutions—Culture, Moral and Intellectual, as Reflected in Imaginative Literature and in the Fine Arts—Logic—Philosophy—Education.**

---

New York **G. P. Putnam's Sons** London

## Date Due

| | | | |
|---|---|---|---|
| OC 13'51 NO20'52 | | | |
| OC 14'54 | | | |
| OCT 16 '56 | | | |
| | | | |
| | | | |
|

GN17 .H12
History of anthropology,
Princeton Theological Seminary-Speer Library
1 1012 00005 4058